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Wednesday

AN ACCOUNT

OF

THE REGULAR GRADATION

IN MAN,

AND

IN DIFFERENT ANIMALS AND VEGETABLES;

AND

FROM THE FORMER TO THE LATTER.

ILLUSTRATED WITH ENGRAVINGS ADAPTED TO THE SUBJECT.

BY CHARLES WHITE.

READ TO THE LITERARY AND PHILOSOPHICAL SOCIETY OF MANCHESTER,
AT DIFFERENT MEETINGS, IN THE YEAR 1795.

" Ad eum modum ſummus opifex rerum ſeriem concatenavit a planta ad hominem, ut
" quaſi ſine ullo cohæreant intervallo; ſic ζωόφυτα cum plantis bruta conjungunt; ſic cum
" homine ſimia quadrupedes. Itaque in hominis quoque ſpecie invenimus divinos, humanos,
" feros." SCALIGER.

LONDON:
PRINTED FOR C. DILLY, IN THE POULTRY.
M.DCC.XCIX.

THIS ACCOUNT

OF

THE GRADATION IN MAN, &c.

IS INSCRIBED TO

SIR RICHARD CLAYTON, BART.

BY

HIS AFFECTIONATE

AND MOST FAITHFUL

HUMBLE SERVANT,

THE AUTHOR.

Manchester, February, 1799.

ADVERTISEMENT.

THE Author of the following Eſſay has no deſire to elevate the brute creation to the rank of humanity, nor to reduce the human ſpecies to a level with brutes; and he hopes that nothing advanced will be conſtrued ſo as to give the ſmalleſt countenance to the pernicious practice of enſlaving mankind, which he wiſhes to ſee aboliſhed throughout the world. Neither is he deſirous of aſſigning to any one a ſuperiority over another, except that which naturally ariſes from ſuperior bodily ſtrength, mental powers, and induſtry, or from the conſequences attendant upon living in a ſtate of ſociety. He only wiſhes to inveſtigate the truth, and to diſcover what are the eſtabliſhed laws of nature reſpecting his ſubject; apprehending, that whatever tends to elucidate the natural hiſtory of mankind, muſt be intereſting to man. He was inſenſibly led to the preſent conſideration, from hearing Mr. *John Hunter*'s Remarks on the Gradation of Skulls, as he ſtated in the introduction to a Courſe of Lectures on Midwifery, which he delivered laſt winter at the Lying-in Hoſpital in Mancheſter.

The

The Author does not profeſs to have a knowledge of natural hiſtory adequate to the extent of his undertaking. Indeed few opportunities have been afforded him for proſecuting ſtudies of this kind, ſince he has been almoſt conſtantly engaged, during the greater part of his life, in the practice of a fatiguing and anxious profeſſion: even the hours which he has employed on this work have been, in a great meaſure, abſtracted from the time uſually dedicated to ſleep. He deſires, therefore, that the preſent Eſſay may be conſidered by the Phyſiologiſt, not as a complete Treatiſe on the ſubject, but only as a collection of hints and obſervations for the uſe of others who have leiſure and opportunity to carry on the inveſtigation.

Thoſe who are well acquainted with natural hiſtory, will, probably think he has made too many, and too long quotations; but it ſhould be remembered that his work may fall into the hands of perſons who may require ſuch aſſiſtance, in order the better to comprehend the Author's deſign: beſides, he wiſhes the reader to be informed of the countenance that has been given to the doctrine of general gradation, by ſome of the moſt learned men of the age.

The ſtudent muſt not, however, expect to find an uniform gradation in all the faculties and powers of different ſubjects: it frequently happens that an inferiority in one particular, is accompanied by a ſuperiority in ſome other particular; ſo that the aſcent or deſcent is not always

ways by equal, but often by irregular ſteps. Some of the leſs important gradations which the Author has enumerated, may not perhaps ſtand the teſt of a ſtrict ſcrutiny; but, on the other hand, many others may yet be diſcovered which have not occurred to him. However that may be, he hopes his obſervations are not improperly announced by the title-page prefixed to them.

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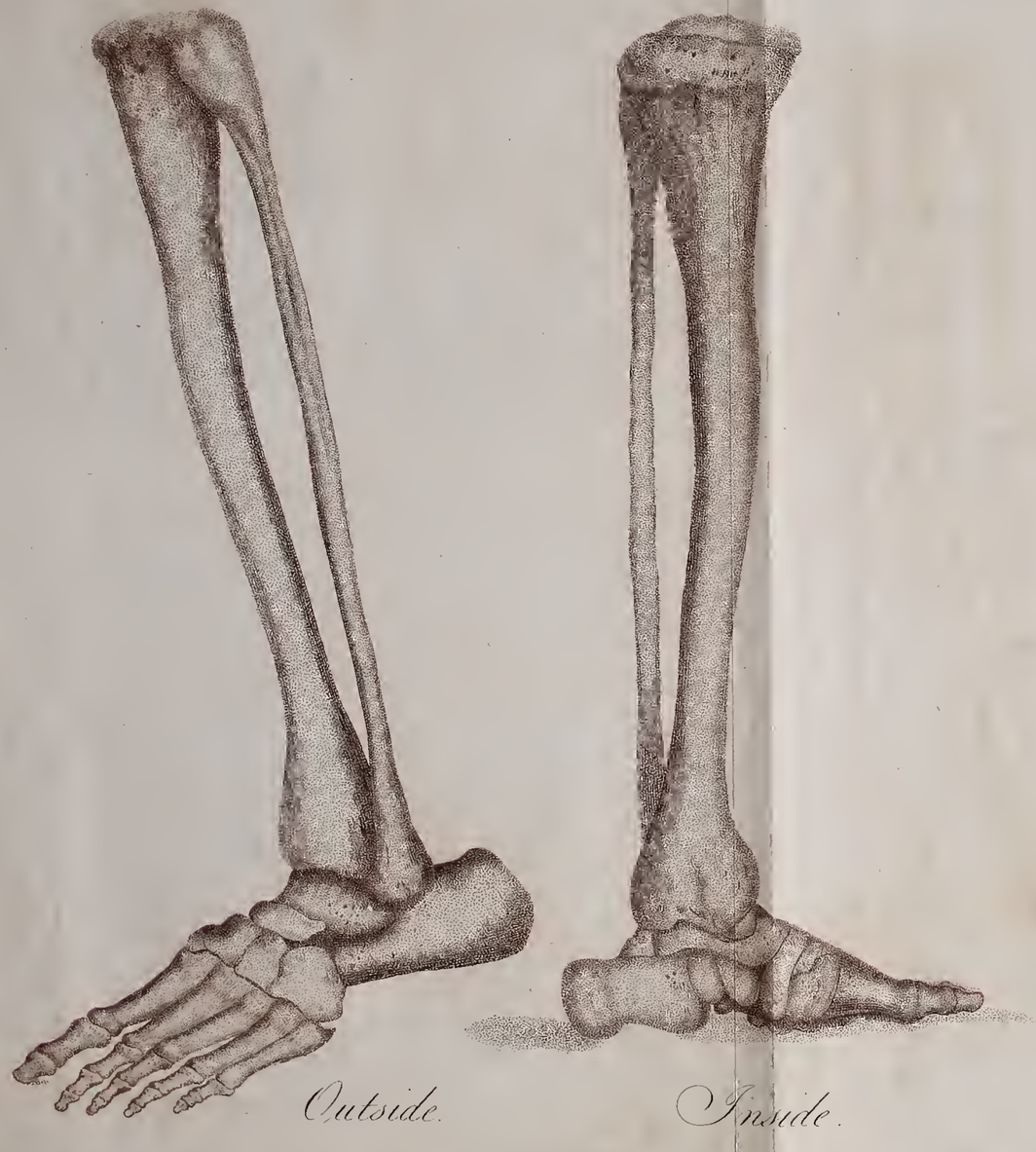
Negro.

Plate 1.st

European
from Cheselden.



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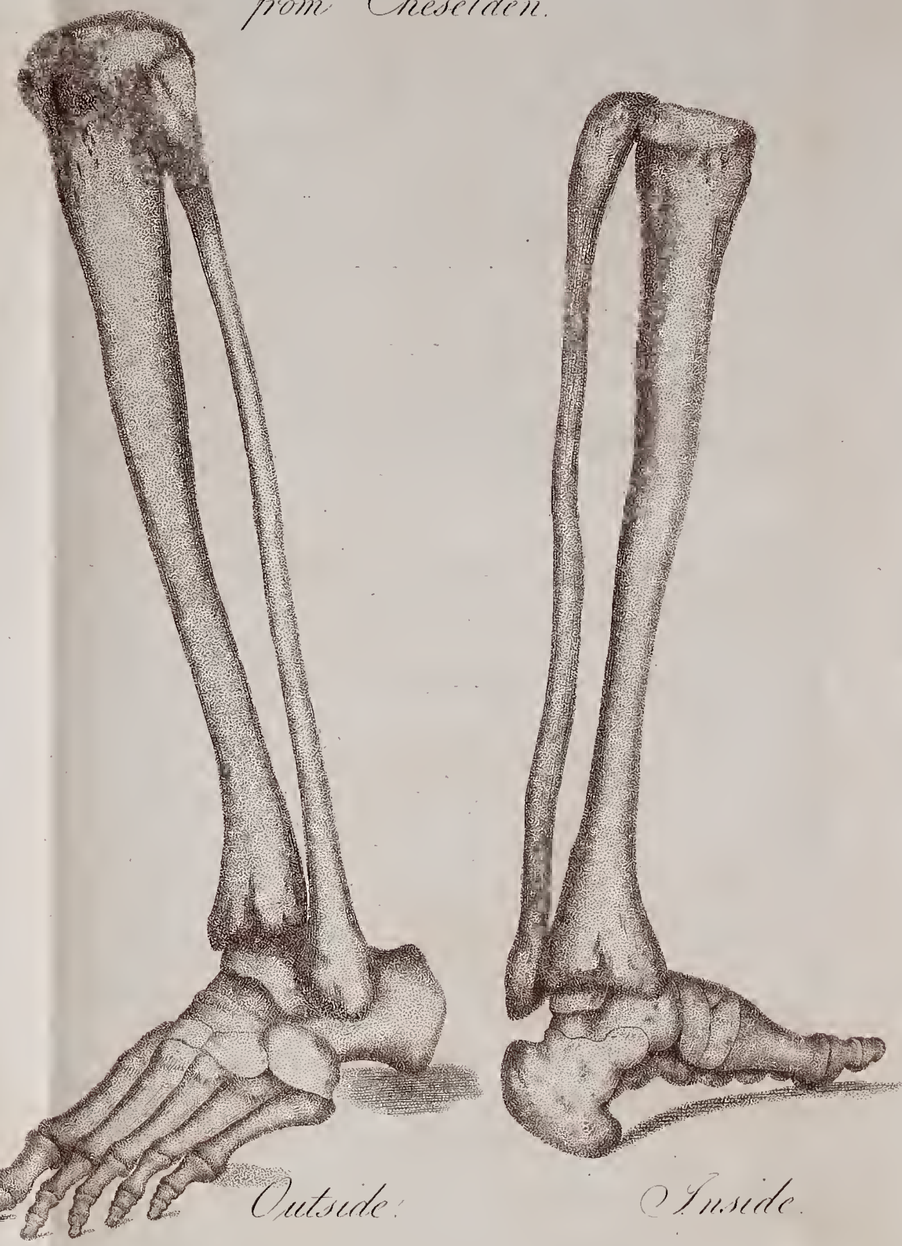


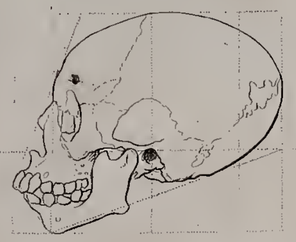
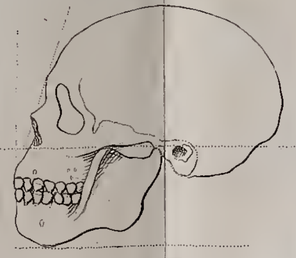
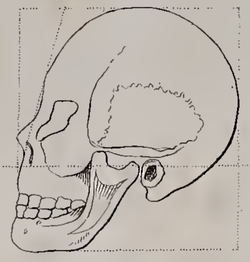
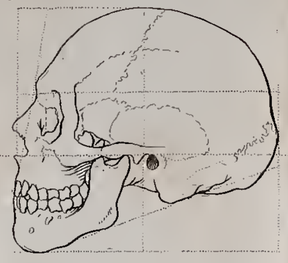
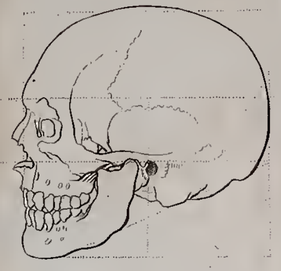
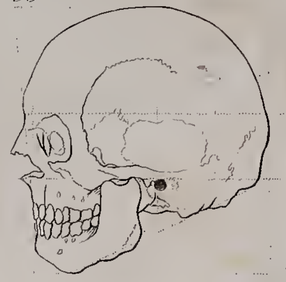
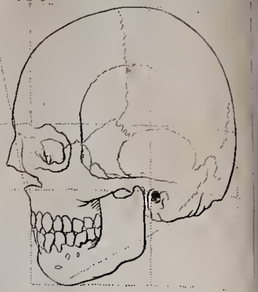
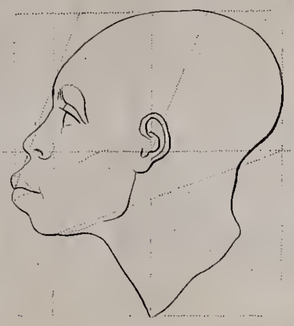
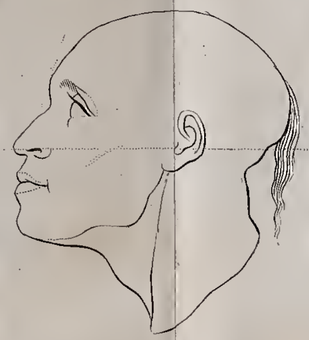
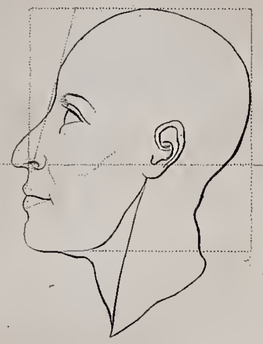
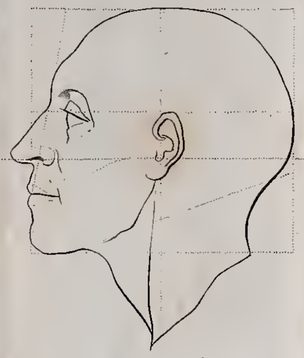
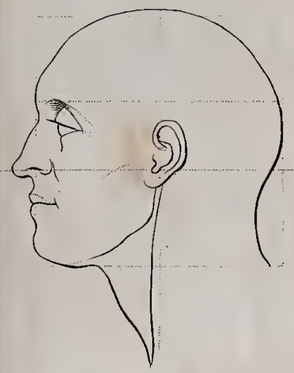
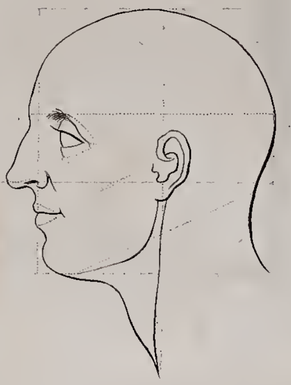
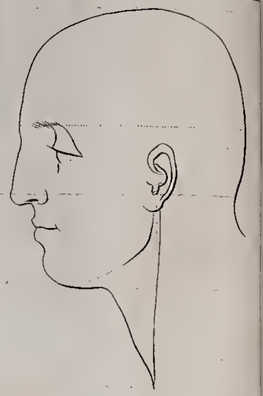
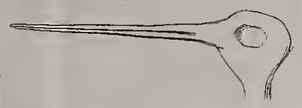
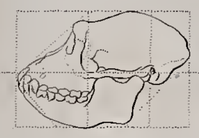
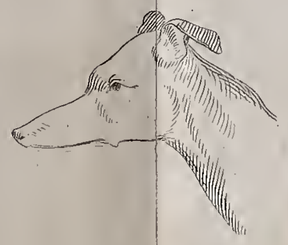
Outside.

Inside.

Rob.t White pinxit.

Perry, Sc.

Plate 2.

Negro.	American Savage.	Asiatic.	European.	European.	Roman Painters.	Grecian Antique.
70°	73½°	75°	80°	90°	95°	100°
						
						
					42° 		58°
						55°	

Snipe. Crocodile. Greyhound. Great Southern Hound. Bull Dog. Monkey. Man of the Woods. Orang Outang.

Golok.

65°

xi
age.
06
17
19
21
id.
25
ii]
39

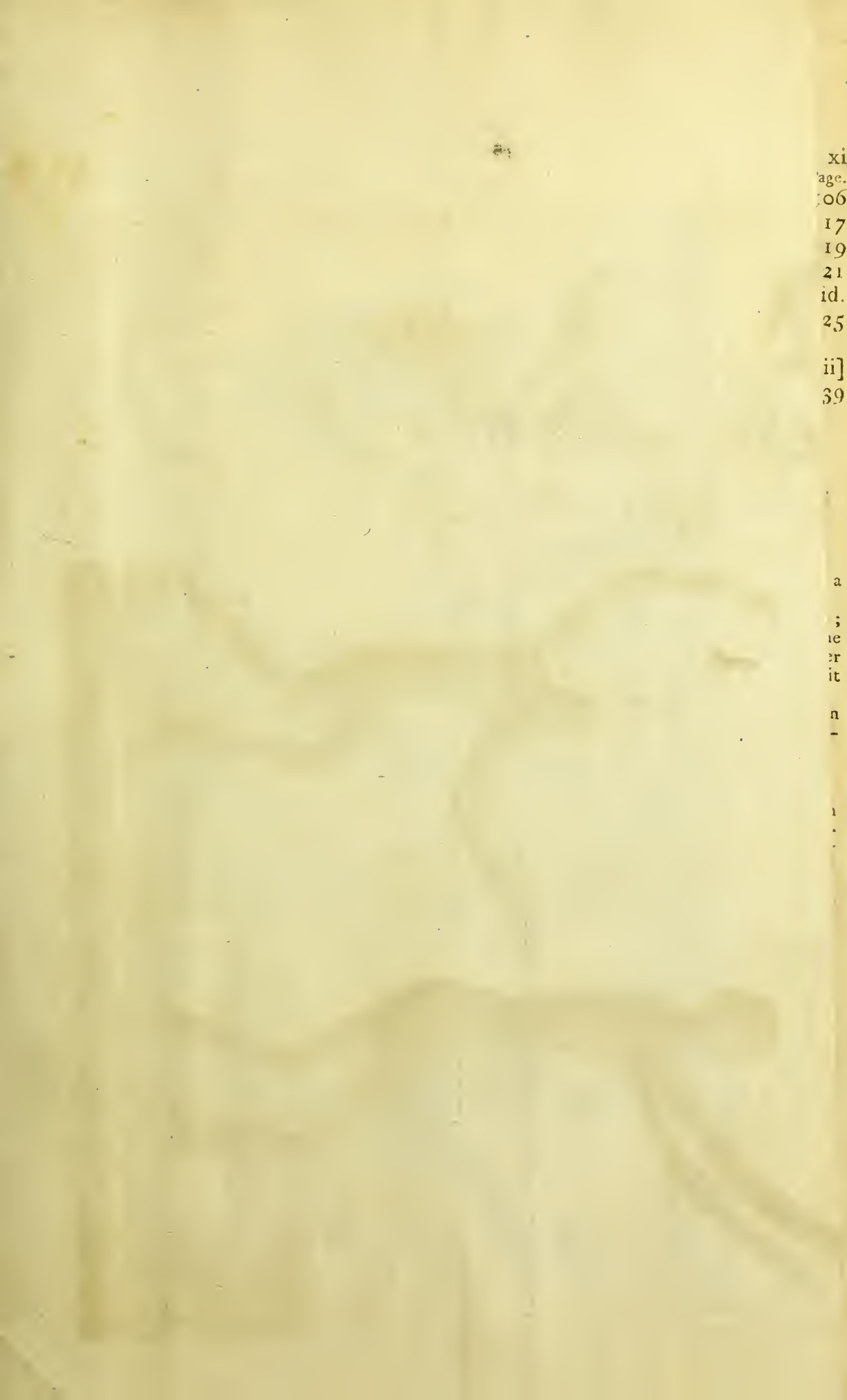
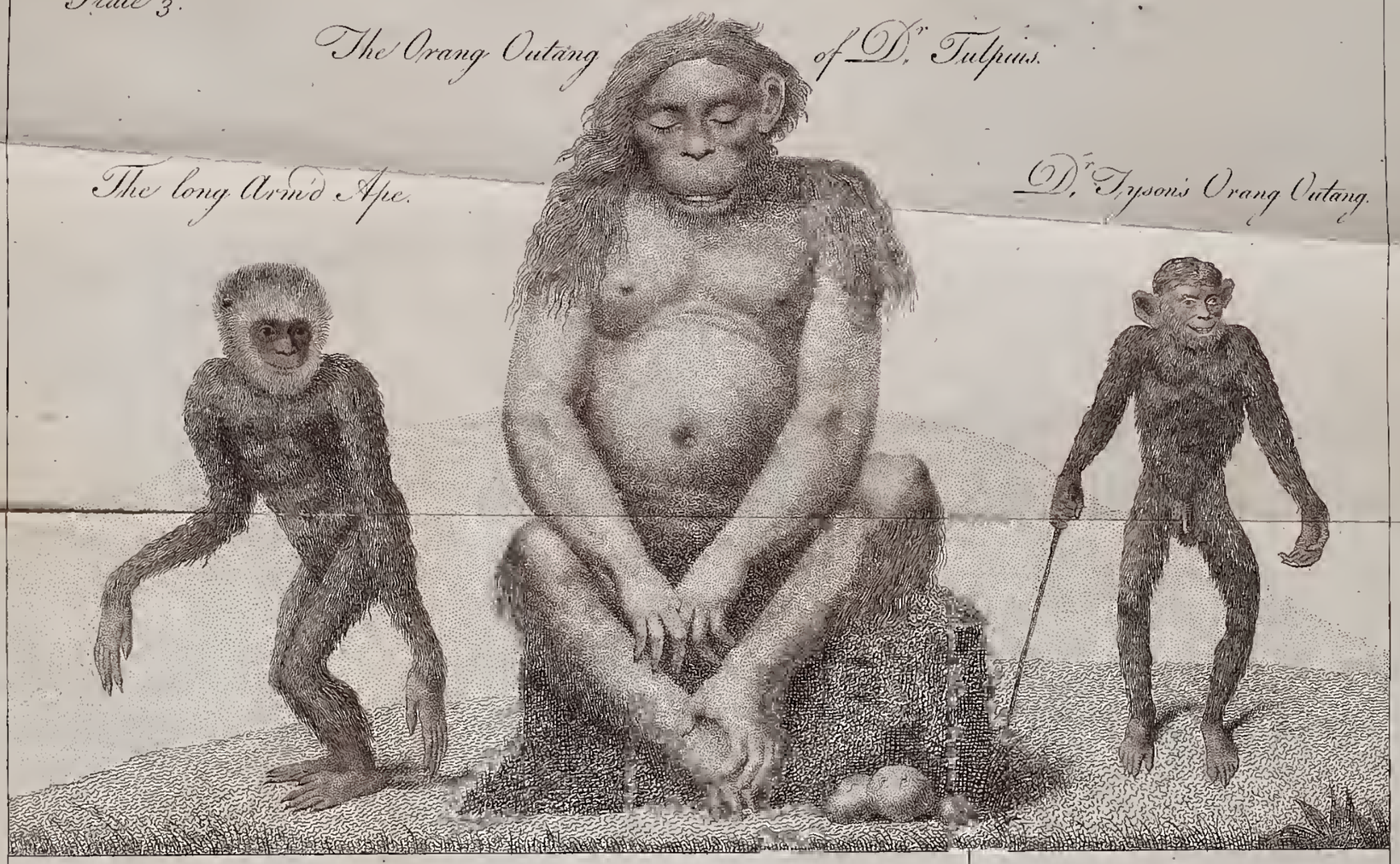


Plate 3d.

The Orang Outang of D.r Tulpius.

The long Arm'd Ape.

D.r Tyson's Orang Outang.

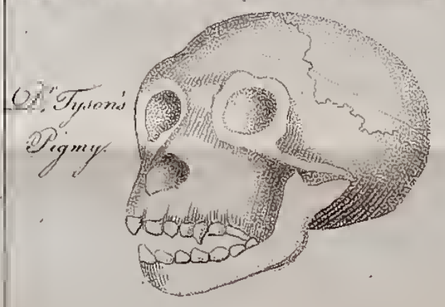


Golok, or; Wild people.

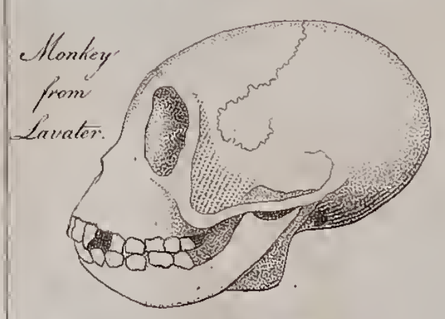
Female.

Male

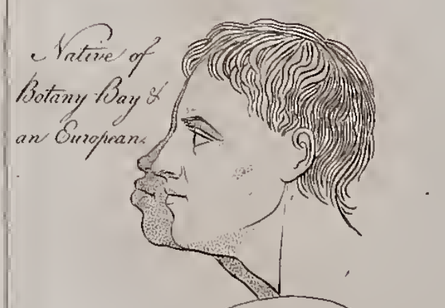
D.r Tyson's Pigmy.



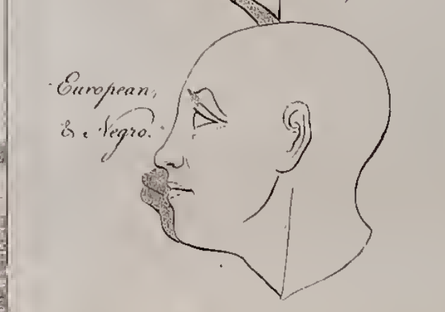
Monkey from Lavater.



Native of Botany Bay & an European.



European, & Negro.



J.Perry fculp.

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PLATE I.

EXPLANATION.

This Plate contains two drawings, taken from the bones of the leg and foot of a Negro ſkeleton in my poſſeſſion, ſhewing both their inſide and outſide.

All the feet of Africans, which I have ſeen, are much flatter than thoſe of Europeans; but what is moſt remarkable in this repreſentation is, the extraordinary ſhape of the *os Calcis*. Whether this is generally the caſe, I will not pretend to ſay. I have another ſkeleton in my poſſeſſion, which I am informed is that of a Negro; but, though flat, it does not poſſeſs that peculiar ſhape.

The other two drawings in this Plate, are copied from Cheſelden's Oſteographia, in order that the reader may compare the ſame bones in the African and European.—(See page 42.)

PLATE II.

This Plate is intended to ſhew the facial line in Man, and in different Animals, from the perpendicular line in the European Man, to the horizontal one in the Snipe or Woodcock, and likewiſe the angle of 95 degrees, to which the Roman painters were very partial, and that of 100 degrees, the model of the Græcian Antiques.—(See page 51.)

In order to obtain the facial line, an horizontal one ſhould be drawn through the lower part of the noſe, and the orifice of the ear, having regard to the os Jugale or cheek-bone. Upon this, another line ſhould be erected, which ſhould touch the forehead and the upper lip. If this be a perpendicular line, it gives you the beſt formed European face, forming an angle of 90 degrees. If it forms an angle of 70 degrees, it gives you the face of the Negro, &c.

PLATE III.

This Plate exhibits copies of the beſt authenticated engravings that have yet been publiſhed of four different kinds of Apes, which approach neareſt to Man: likewiſe

the ſkull of Dr. Tyſon's Pigmy—the ſkull of a Monkey from Lavater—the profiles of a native of Botany Bay and an European—and the profiles of an African and an European.

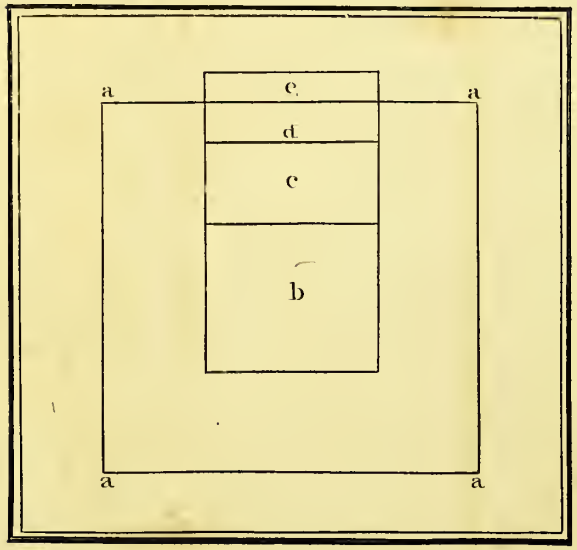
PLATE IV.

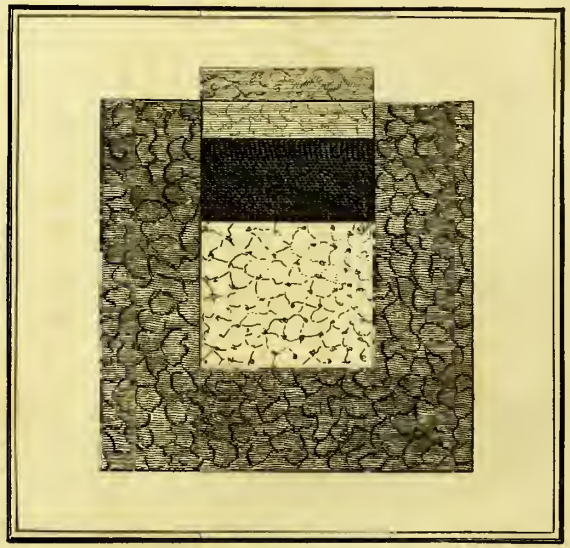
a, *a*, *a*, *a*, Square Portion of the Skin of a Negro.
b, The *Cutis vera*, or True Skin, which is White.
c, The darkeſt *Rete Mucoſum*, which is the under Layer.
d, The Bluiſh or Greyiſh *Rete Mucoſum*, which is the upper Layer.
e, The Cuticle itſelf, a Mixture of Blue and White, or Greyiſh.
See Pages 101 and 102.
See alſo the Plate in Cruikſhank's Experiments on the Inſenſible Perſpiration of the Human Body. Fig. 4.

ERRATA.

PAGE vii, advertiſement, l. ult. after Mancheſter add viz. in 1794.
11. l. 15, for Margineſe *read* Manchineel.
19, l. 5, for alive *read* adive.
ib. l. 6, for Maſomalis *read* Meſomelas.
APPENDIX.
cliii. l. 11, for proportion *read* proportions.
clxvii. l. 20, after that *read* the.
lxiv. l. 10, for vegetation *read* vegetative.

Plate 4th





ACCOUNT

OF THE

REGULAR GRADATION IN MAN,

&c. &c.

PART FIRST.

ON GRADATION IN GENERAL.

EVERY one who has made Natural Hiſtory an object of ſtudy, muſt have been led occaſionally to contemplate the beautiful gradation that ſubſiſts amongſt created beings, from the higheſt to the loweſt. From man down to the ſmalleſt reptile, whoſe exiſtence can be diſcovered only by the microſcope, Nature exhibits to our view an immenſe chain of beings, endued with various degrees of intelligence and active powers, ſuited to their ſtations in the general ſyſtem.

In the animal kingdom, the different claſſes into which Nature ſeems to have divided her productions, are ſo blended by creatures apparently anomalous to all ſyſtem, that it is often difficult, and ſometimes impoſſible, to draw lines of

diſtinction. The inhabitants of the earth and air encroach upon each other; for there are flying *maccaucoes*, flying *mice*, flying *ſquirrels*, and *bats*, which, though quadrupeds, have wings to buoy themſelves up in the air; and, on the other hand, there are ſome birds that cannot fly at all, as the *oſtrich*, the *touyou*, the *caſſowary* and the *dodo*: — the porcupine, though a quadruped, has quills. Nor are even the inhabitants of the ſea and thoſe of the air much better diſcriminated; for we meet with flying fiſh, and birds that inhabit the waters. Amphibious animals link the terreſtrial and aquatic; we find ſome fiſh with and others without lungs. The diſtinction of animals into viviparous and oviparous is not more definite; for vipers and cartilaginous animals produce their eggs within their own bodies, previous to the excluſion of the live animal; and ſome animals are, like vegetables, propagated by germs, neither viviparous nor oviparous. Bipeds, quadrupeds and quadrumanuſes equally encroach on each other; there are ſome apes that walk only on their hind-legs, and others that walk on all four; and the greateſt part of them uſe their hind-feet in the manner of hands. The genus *Lacerta*, from the alligator of twenty feet to the lizard of three inches, forms a claſs of animals connecting the race of quadrupeds with that of reptiles.

Several eminent Naturaliſts have endeavoured, in vain, to define the boundaries of the animal and vegetable kingdoms. Mr. *John Hunter* maintained, that all animals

have ſtomachs, and that vegetables have not; that all zoophytes are animals, though they have no loco-motion, nor even any motion at all, but are fixed to a rock, where he ſuppoſed them to be nouriſhed by the ſea throwing food into a cavity which he called a ſtomach. This has however been denied by others. Mr. *Smellie* ſays, "The polypus has no ſtomach, or rather, like vegetables, its whole body may be conſidered as a ſtomach. Its natural cavity contains no viſcera; and when this animal is turned outſide-in, it ſtill continues to live and to digeſt its food, in the ſame manner as if it had received no injury. The mode by which plants are nouriſhed is extremely analogous; they imbibe by the roots, the trunk, the branches, the leaves, and the flowers. Inſtead therefore of having no ſtomach, their whole ſtructure is ſtomach. In regard to the brain, the polypus and many other inſects are deprived of that organ. Hence neither ſtomach nor brain are eſſential characters which diſtinguiſh the animal from the vegetable." *

Buffon ſays, the freſh-water polypus may be regarded as the laſt of animals and the firſt of plants.

No diſtinction of plants and animals can be derived from the ſexual œconomy. The generality of plants indeed are hermaphrodite; that is, they have the male and female organs of generation within the ſame impalement;

* For theſe and other ſimilar diſcoveries and obſervations, Naturaliſts are much indebted to *Trembly*, *Bonnet*, and *Spallanzani*.

but ſeveral animals, as ſhell-fiſh, and others deprived of the power of moving in ſearch of mates, have likewiſe both ſexes in one individual. The female fiſh, in ſome inſtances, lay their eggs upon the ſhore, which are afterwards impregnated by the male, without his ever ſeeing the female. Something analogous to this is obſervable in ſome plants.

The ſyſtem which attributes ſenſation to animals and denies it to vegetables, is very illuſory:—many vegetables, acknowledged to be ſuch, are much more irritable than ſome animals. There are ſome ſenſitive plants ſo extremely irritable, that if they are touched by any ſubſtance, the whole plant, both leaves and branches, falls to the ground. The *dionæa muſcipula* *, or Venus's fly-trap, is a plant whoſe leaves are ſo irritable, that when any fly alights upon them, they cloſe upon it and ſqueeze it to death †. The *hedyſarum gyrans*, or moving plant, poſſeſſes and exerts the power of moving its leaves in various directions, as an animal does its members ‡.

No criterion of diſtinction betwixt plants and animals can be obtained from their ſituation or manner of living. Plants as well as animals are found on land and in water.

* Ellis on the Dionæa Muſcipula.

† See the Annual Regiſter for 1775, page 93.

‡ See Encyclopædia Britannica, Art. *Hedyſarum*.

Worms, &c. live under ground; and truffles (*lycoperdon tuber*) vegetate and are perfected without appearing above ground. There are paraſitical plants, or ſuch as vegetate upon and receive their nutriment from other plants, as the miſletoe, &c. and there are animals whoſe natural and deſtined habitation ſeems to be the bodies of other animals. Some animals draw their nouriſhment from plants, and ſome plants are propagated upon animals, as horns, beaks, hair, nails, &c. which can be conſidered in no other light than that of vegetables.

Dr. *Bell*, in his inaugural theſis "De Phyſiologia Plantarum," publiſhed at Edinburgh, 1777 (a tranſlation of which is inſerted in the ſecond volume of the Memoirs of the Literary and Philoſophical Society of Mancheſter) after having expoſed and illuſtrated the vegetable œconomy, in his concluding obſervations, remarks, that the chain of being is continued from animals to plants, and that it is in vain to attempt to eſtabliſh rules by which plants may be diſtinguiſhed from animals in all caſes. From ſome circumſtances common in the generation, ſtructure, and pathology of animals and plants, he is inclined to believe that plants are not, as is generally imagined, deſtitute of ſenſation. Dr. *Percival*, in an ingenious paper 'on the perceptive power of vegetables,' in the ſame volume of memoirs, has ſtated arguments with great force and perſpicuity, tending to eſtabliſh the opinion, that plants, as well as animals, are endued with perception in different degrees. The opi-

nion is certainly far from being irrational: perception, as a faculty, is like others, ſuſceptible of degrees; and the general order of things ſufficiently evinces, that a gradation in the powers and faculties of created beings, is an eſtabliſhed principle in the laws of nature. In addition to what theſe authors have advanced on the analogy of plants to animals, it may be obſerved that plants ſleep in the night, and young ones in both caſes require more than old ones; alſo plants, like animals, grow more in the night than in the day. † Vegetables, as well as animals, perſpire more in hot ſunſhiny weather than in cold; like animals, they have lungs by which they breathe, and, like them too, they are ſubject to diſeaſe, both local and general, and to loſs of limb as well as life. Plants ſhed their leaves as birds do their feathers, and quadrupeds their hair. Plants, like animals, require

† *Diſeaſes of Trees.* — There is no limit to the reſearches of modern philoſophy. We find the following curious morſel in a Treatiſe on the Maladies of Elms, read at the late *Inſtitut* at Paris:—

"It is a long time ſince the Abbe *Roger Schabol* has ſhewn, with much ſagacity, the reſemblances which ſubſiſt between the animal and vegetable œconomy, and the ſimilitude both of the maladies and remedies, particularly in thoſe which are called Surgical Caſes. We may apply this theory to all the maladies which ariſe from checked tranſpiration and interrupted circulation.

"Trees are animated; they have their food, their enjoyments, their grief, their health, their illneſs, their watching, their ſleep, their emanations, their abſorptions, their infancy, their growth, their puberty, their manhood, and their love.

"The antients placed a nymph under their rind: to be ſure ſhe is there. Life is a very pretty nymph. We ought to reſpect her wherever ſhe is found.

"The man who does not find in animals younger brothers, and in plants couſins more or leſs removed, is unacquainted with his own nature, and is devoid of the elements of morality."

different ſorts of food, and will go in ſearch of them. Plants will regenerate their diſmembered parts, and animals their loſt limbs and ſeveral other parts.* The circulation of the fluids in vegetables bears a great analogy to that of animals.†

The learned Dr. *Watſon*, Biſhop of *Llandaff*, in his elegant Eſſays on the ſubjects of Chemiſtry, has made ſome very pertinent obſervations on the three kingdoms; which my reader will excuſe me for quoting at ſome length. He ſays, 'If it be aſked what are the diſcriminative characteriſtics 'of minerals, vegetables, and animals, as oppoſed to one 'another, I plainly anſwer that I do not know any, either 'from natural hiſtory or chemiſtry, which can wholly be 'relied upon. Syſtematic diſtinctions and ſpecific diviſions 'of things are uſeful in enlarging the comprehenſion of the 'mind. By methodizing the objects, they ſeem to extend 'the boundaries of knowledge; but having no real foundation in nature, they ſhould not be depended on too far; 'they often perplex or impede the progreſs of a curious 'enquirer. This prepoſſeſſion in favour of ſyſtematic arrangements, operates the more forcibly upon us as the 'ideas to which it is uſually annexed become the more 'abſtracted. The ſtrongeſt analogies are overlooked, the 'plaineſt reaſonings thought fallacious, and deciſive experi-

* See Biſhop *Watſon*'s Eſſays on the ſubjects of Chemiſtry; and my paper on the Regeneration of Animal Subſtances, *Mancheſter Memoirs*, Vol. I.

† See Note (1) at the end.

‘ments inconclusive, when their tendency is to subvert a ‘distinction of which we had wrongly supposed Nature her- ‘self the author. Every one thinks he knows what an ‘animal is, and how it is contradistinguished from a vege- ‘table; and would be offended at having his knowledge ‘questioned thereupon. A dog or a horse, he is truly per- ‘suaded, are beings as clearly distinguished from an herb or ‘a tree, as light is from darkness; yet as in these, so in the ‘production of nature, the transition from one to the other ‘is effected by imperceptible gradations. Naturalists as well ‘as Chymists have perhaps too precipitately embraced the ‘opinion, that minerals may be certainly and readily distin- ‘guished from the other two kingdoms. A vascular system, ‘a nutritive succus, and a power of producing its like, con- ‘stitute the abstract idea both of a vegetable and an animal ‘as contradistinguished from a mineral: this idea is clear ‘and definite in itself; but to determine how far the coex- ‘istence of these qualities is in the nature of things necessary, ‘or where any of them ceases to exist, is a question of vast ‘difficulty, when applied to particular cases. Stones dug out ‘of quarries, ores out of mines, in general minerals separated ‘from their matrices, are like the dead branches or limbs ‘of vegetables or animals, incapable of receiving increase, ‘except from an external incrustation; but whether the ‘matrices themselves increase, or, that being in some cases ‘granted, whether they receive their augmentation from ‘an external apposition, or an internal assimilation and ‘extention of parts, cannot readily be decided either way.

'In the Cretan Labyrinth it hath been obſerved, that the 'names of travellers, which have been cut in the rock in 'former ages, are now in *alto relievo*; and the older the 'dates are, the greater is the protuberance, reſembling the 'callus formed by the inciſions in trees. In the mines in '*Chremnitz*, in *Hungary*, which have been wrought for 'above one thouſand years, the ancient roads which had 'been cut through the rocks are left to grow up; and it 'is remarked that they approach one another in an hori-'zontal and not in a perpendicular direction. The ſame 'phenomenon may be obſerved in the marble quarries in '*Italy*, as is mentioned by *Baglivy*, in his Treatiſe upon the 'Vegetation of Stones: but whether theſe, and many ſimilar 'appearances, are to be attributed to the preſſure of the 'ſuperincumbent *ſtrata*, or to a kind of vegetable growth, 'is a doubtful point. Rock-cryſtal, amethyſts, and various 'precious ſtones have been thought by *De Boot* to grow 'like muſhrooms. Certain it is that they often con-'tain in them ſeveral heterogeneous particles: a circum-'ſtance which proves them to have been once in a fluid 'ſtate, and induces a ſuſpicion, that in their formation they 'may reſemble the gums and reſins extravaſated from va-'rious ſpecies of vegetables. The vegetation of ſtones 'hath been admitted by many; and ſome have contended 'that minerals, as well as animals and vegetables, ſpring 'from ſeed; the greateſt being nothing but the expanſion 'of the parts of a minute grain of ſand.'

Again, the learned Biſhop further adds,—'Many minerals 'ſeem in their formation to have been antecedent, others 'ſubſequent to the univerſal deluge. A great part of the 'matter conſtituting the outward ſhell of the earth (the 'only part which we can examine) hath been ſubſervient 'to vegetable or animal life. All the *ſtrata* of limeſtones, 'chalks, marbles, all gypſums, ſpars, alabaſters, &c. are 'confeſſedly of animal origin. The *ſtrata* of pit-coal and 'of all bituminous foſſils, of ſome ſpecies of ſlates, whate-'ver may be thought of argillaceous *ſtrata* in general, the 'mould everywhere covering the ſurface of the earth and 'other ſubſtances, are ſuppoſed probably enough to have ari-'ſen from the deſtruction of vegetables; ſo that I know not 'whether it would be a very extravagant conjecture which 'ſhould ſuppoſe that all matter is, or has been, organized, 'enlivened, animated.'

If then, according to the opinions of the above-mentioned excellent naturaliſts, we are not able to draw lines of diſtinction between the three kingdoms; if we cannot point out where ſenſation ends, nor aſcertain whether organization does not always imply ſome degree of concomitant ſenſation, we may fairly infer, till the contrary can be proved, that Nature deſcends by gradual and imperceptible ſteps from man down to the leaſt organized beings; that one ſort of ſenſation is given in greater perfection to one creature, and another ſort to another; ſo that often the exceſſes in

the one hand muſt nearly compenſate for the defects in the other, and thereby make it difficult to form a comparative eſtimate of the ſum total of their ſenſitive powers.

In ſurveying the productions of the different climates and regions of the earth, the following obſervations naturally ariſe:—The animal world, particularly domeſtic animals ſubſervient to the uſe of man, are in the greateſt perfection in the temperate zone; as horſes, cows, ſheep, goats, ſwine, dogs, &c.

The vegetable world is in the greateſt perfection in the torrid zone, both trees, ſhrubs, fruits, ſpices, roots, poiſonous plants, and medicinal plants; as the mahogany-tree, ſweet ſmelling cedar, the fuſtic-tree, *magnolia grandiflora*, Peruvian bark-tree, bread-fruit-tree, oranges, lemons, citrons, ſhaddocks, limes, fruit-bearing paſſion-tree, margineſe-tree, cinnamon, cloves, nutmegs, pine-apples, melons, *bohun upas*, or poiſon-tree of Java, and aloes; likewiſe thoſe plants which more peculiarly exhibit tokens of ſenſation; as the ſenſitive plant, moving plant, Venus's fly-trap, &c.

The vegetable world appears to be in the leaſt perfection in the frigid zone.

The moſt ferocious animals live in the torrid zone, and alſo the moſt venomous and poiſonous.

Animals have the longeſt hair upon their bodies in the frigid zone, to ſerve them as a defence againſt cold; but animals which naturally inhabit the torrid zone have the thickeſt ſkins, to defend them from the heat.

The loweſt order of animals, or thoſe which approach neareſt to vegetables, are inhabitants of the watery element, or live in the earth; ſuch as the water-polypus, lithophytes, zoophytes, corals, corallines, ſea-worms, earth-worms, and lalan-lout.*

Inſects and reptiles, both for ſize and colour, are in the greateſt perfection in America, or what is called *the new world.*

Thoſe animals that approach neareſt to man in figure, in intelligence, or in the faculty of ſpeech, inhabit the torrid zone; as orang-outangs, or wild men, elephants, and parrots.

Many animals and vegetables, both thoſe that live on land and in water, are adapted to the torrid zone, and cannot live in the frigid, or even the temperate zone; and *vice versa.* The rein-deer, the glutton, and the marmott, cannot ſubſiſt even in a temperate climate, but are confined to the frozen regions; and the large white bears cannot live in the torrid zone by any art, nor even in the tempe-

* See Philoſophical Tranſactions, vol. 68, page 178.

rate zone, unleſs their keepers are perpetually throwing cold water upon them. The elephant, rhinoceros, and camel, and many other animals, cannot live in the frigid zone by any contrivance; nor can they exiſt in this temperate climate without warm clothing and a warm ſtable. Some fiſhes, as well as birds of paſſage, are obliged * to change their climate when it is either too hot or too cold for them. Several plants will not grow in warm climates; and very many will not grow in cold ones.

It appears then that moſt animals and vegetables are adapted to ſome particular climate, ſoil, or ſituation, and cannot flouriſh in any other without great art and care: even with theſe they ſeldom arrive at the perfection attained in their proper climate; nor will any length of time habituate them to a different region. Melons, cucumbers, and ſeveral other plants have gone through above a hundred generations in this kingdom, and ſtill they bear the climate no better than at firſt; from which it may be concluded that no time, however long, will aſſimilate their conſtitution to that of our indigenous plants. The experience of our gardeners ſufficiently proves, that in order to preſerve a collection of exotic plants in tolerable perfection, it is neceſſary to procure for them every diverſity of temperature, ſoil, and ſituation which may be ſuited to their reſpective exigencies.

* Dr. *Darwin* denies that birds emigrate from neceſſity: he argues that emigration is with them a matter of choice. *Zoonomia*, page 167.

The gradation that exiſts in the animal kingdom, extends to the organs of ſenſation, as theſe differ in different ſubjects with reſpect to ſenſibility, dimenſions, figure, &c. It alſo extends to the various diſpoſitions in the animal economy. It may be traced from the brain of the human European, which is the largeſt of any animal we are acquainted with, be its ſize ever ſo enormous, to the polypus, who has none at all—from the keen eye of an eagle and a hawk, and the great number of eyes of a fly, to thoſe animals that have none, as the blind worm—from the acute olfactory nerves of a dog, to thoſe animals who have not the faculty of ſmelling—from the large ears of an aſs, to thoſe that are void of that organ—from animals whoſe feeling is exquiſite, to thoſe that have comparatively little ſenſation—from the catamenia of an European female, to thoſe animals that have no ſuch diſcharge—from animals that have the greateſt evacuation by ſweat, to ſuch as have not that diſcharge, as the dog—from the quills of the porcupine, the ſpines of the hedge-hog, and the long coarſe hair of an arctic bear, to the ſoft ſleek hair of the mole and the dormouſe—from the thin ſkin of the human European face, to the thick coat of mail of the elephant and the rhinoceros—from the milk white to the jet black colour of many animals and vegetables, both birds, quadrupeds, fiſhes, inſects, reptiles, and the flowers of plants—from the high prominent noſe of the human European, to thoſe that are perfectly flat—from the projecting chin of man, to thoſe animals who

have no chin—from the perpendicular face of the human European, to the horizontal one of the woodcock—from the ſhort jaw-bone of man to that of the whale, which is the longeſt known—from the double row of ſharp teeth of the ſhark, the grinders and tuſks of an elephant, and the teeth of a lobſter, which are placed in the ſtomach, to thoſe which have none—from the gizzard of a bird, which is compoſed of two ſtrong muſcles placed oppoſite to and acting upon each other as two grindſtones (the two flat lateral ſurfaces of the grinding cavity being lined with a thick horny ſubſtance) to the moſt tender membranous ſtomach, which digeſts the food by its own gaſtric juice, the former being more peculiarly adapted for vegetable and the latter for animal food—from thoſe animals which bring forth but one at a birth, to thoſe who are ſeen to produce a thouſand, as the ſpider and the beetle.

Lavater is of opinion, that the ſame gradation holds good in phyſiognomy; he ſays, 'From the weakeſt of winged 'inſects up to the towering eagle, from the worm which 'crawls under our feet, up to the elephant, up to the formidable lion, you everywhere diſcover a gradation of phyſiognomical expreſſion.'

M. *Bonnet* obſerves, that if we ſurvey the principal productions of nature, we ſhall perceive, that betwixt thoſe of a different claſs, and even thoſe of a different ſpecies, there

will always be found ſome which will apparently link the claſſes or ſpecies together. The polypus forms the moſt ſtriking inſtance, which combines the properties of an animal with thoſe of a vegetable.* He has given us a ſcale of beings on the principle of gradation, and pointed out thoſe particular ſubjects which ſeem to connect the different claſſes, ſo as to form but *one* group of organized bodies. Whatever exceptions may be made to the ſcale, it is certainly ingenious; and as it bears a near relation to the ſubject before us, we ſhall give it a place.

* See Note 3.

IDEA OF A SCALE OF NATURAL BEINGS.

By M. Bonnet.

Man.

Orang-outang
Monkey

Quadrupeds.

Flying ſquirrel
Bat
Oſtrich

Birds.

Aquatic bird
Amphibious bird
Flying fiſh

Fiſh.

Creeping fiſh
Eel
Water-ſerpents

Reptiles.

Slug
Snail

Snails (with ſhells)

Pipe-worms
Moth

Inſects.

Gall-inſects
Tape-worm
Polypus
Sea-nettle
Senſitive plant

IDEE D'UNE ECHELLE DES ETRES NATURELS.

Par M. Bonnet.

L'homme.

Orang-outang
Singe

Quadrupeds.

Ecureuil volant
Chauve-ſouris
Autruiche

Oiſeaux.

Oiſeau aquatique
Oiſeau amphibie
Poiſſons volans

Poiſſons.

Poiſſons rampans
Anguilles
Serpens d'eau

Serpens.

Limaces
Limaçons

Coquillages.

Vers á tuyau
Teignes

Inſectes.

Gallinſectes
Tænia, ou ſolitaire
Polypes
Orties de mer
Senſitive

Plants.	*Plantes.*
Lichens	Lychens
Mouldineſs	Moiſiſſures
Muſhrooms	Champignons agarics
Truffles	Truffles
Coral	Coraux & coralloides
Lithophytes	Lithophytes
Amianthes	Amianthe
Talcs, Gypſums, Selenites	Talcs, Gyps, Selenites
Slate	Ardoiſes
Stones	*Pierres.*
Figured ſtones	Pierres figurèes
Chryſtallized ſtones	Chryſtallizations
Salts.	*Sels.*
Vitriols	Vitriols.
Metals.	*Metaux.*
Semi-metals	Demi-metaux
Brimſtone.	*Soufres.*
Bitumens	Bitumes
Earths.	*Terres.*
Pure Earth	Terre pure
Water.	*Eau.*
Air.	*Air.*
Fire.	*Feu.*
More Subtile Matter	*Matieres plus ſubtiles*

OBSERVATIONS ON THE GENUS OF ANIMALS CALLED *CANIS* BY NATURALISTS.

LINNÆUS reckons fourteen ſpecies: — 1. The Dog; 2. the Wolf; 3. Hyæna; 4. Mexicana; 5. Fox; 6. Lagopus, or Arctic Fox; 7. Indica, or Antarctic Fox; 8. Grey Fox of Cateſby; 9. Silver Fox of Louiſiana; 10. Barbary Fox, or Jackall alive; 11. Jackall; 12. Maſomales; 13. Thous; and, 14. Zerda.

It is almoſt impoſſible, in many caſes, to determine where one ſpecies ends and another begins. *Buffon* was of opinion that all animals that would breed together, and whoſe progeny would breed again, were of the ſame ſpecies. If this were true, the wolf, the jackall, and the dog ſhould be one ſpecies; for Mr. *J. Hunter* has proved that they will breed together, and that their iſſue will breed again: and I have been very credibly informed that the ſame thing has frequently happened betwixt the dog and the fox; but of this Mr. *Hunter* had ſome doubts. Theſe unnatural unions, however, are ſeldom obtained without ſome ſtratagem.

Linnæus enumerates eleven, *Buffon* no leſs than twenty-ſeven varieties in the ſpecies of the domeſtic dog. All dogs can ſwim; but there is great difference in this re-

ſpect, as ſome are peculiarly adapted for the water, and ſeem moſt happy when in it; others never go in but by compulſion. There ſubſiſts a gradation in the conſtitution, faculties, and organs of the different ſorts of dogs. The hound, beagle, &c. excel in ſmell: the bull-dog has this ſenſe leſs acute than many others. Some dogs hunt their prey in the fields and woods, and others under ground, being ſeverally adapted to thoſe particular purpoſes. The bull-dog has a ſhort round head and ſtrong jaws, betwixt which and the long narrow head and ſlender jaws of the grey-hound, there are ſeveral intermediate degrees. The coat of the dog varies, from that of the long rough haired Pomeranian dog to the Turkiſh dog without hair; nor does this depend altogether upon climate, as many dogs are covered with hair in a much hotter climate than that of Turkey; and ſome dogs have long and others ſhort hair in the ſame climate. There is a variety in the bark, howl, or cry of dogs: the bull-dog and maſtiff bark very loud, and the alco, the native dog of the Weſt India iſlands, never barks at any time: the grey-hound barks little; and the hound in giving mouth has a particular howl or cry, called the Tongue. The noſe of dogs is longer than that of man, and better adapted internally for acute ſmelling, having a longer convoluted ſurface on which the *membrana pituatoria* is ſpread: the ſame ſtructure is obſervable in other quadrupeds, moſt of which have the *oſſa ſpongioſa* large, and ſubdivided into a great number of exceſſively fine thin *lamellæ*. The ſenſibility ſeems indeed to be always increaſed in proportion to the ſurface of the organ.

It will be proper here to obſerve, that dogs have no *fræ-num præputii*, and that a bitch has a larger *clitoris* than perhaps any other animal.

There is a great number of different ſorts of wolves, foxes, and of all the other ſpecies of *canis*, ſome of which approach ſo near to the dog, that it is almoſt impoſſible to determine where the ſpecies begins and ends. So many varieties of dogs have been further produced by croſſing the breed, that one might expect no one ſort would remain entire; and yet they all ſeem to be preſerved in as great perfection as ever. Does not this afford a ſtrong preſumption that the different ſorts of dogs are in reality diſtinct ſpecies?*

The cries of the wolf and the jackall are very ſimilar; they are principally conveyed through the noſe, and exactly reſemble that noiſe in dogs which is a mark of longing or melancholy, and alſo of fondneſs; but they have never any reſemblance to the barking of a dog.

It would be endleſs to attempt to ſhew the gradation of animals in its full extent: I ſhall therefore only make ſome

* See Note 2.—Dr. *Anderſon*, in an Appendix to "An Account of the different Kinds of Sheep found in the Ruſſian Dominions," ſtrenuouſly maintains that the different ſorts of dogs are diſtinct ſpecies: he alſo makes ſome pertinent ſtrictures upon Buffon, in regard to this matter. His ideas on the ſubject nearly agree with mine, except where he argues that the produce of a mongrel cannot in any

obſervations upon a few genera out of one or two claſſes, ſelecting thoſe which, in the arrangements of natural hiſtory, rank neareſt to man, as the order of *primates* in the claſs of *mammalia*. The loweſt genus of this order is,

VESPERTILIO; OR, THE BAT.

There are at leaſt 22 ſpecies of this genus. The *penis* is looſe and pendulous: a circumſtance peculiar to mankind, monkies, and to this genus.

LEMUR; OR, MAUCAUCO.

There are about a dozen ſpecies of this genus. 'It 'forms a kind of link between the race of apes and the 'ferocious quadrupeds, having the flat nails of the former 'combined with the crooked claws of the latter; and, ex-'cept in the hand-like uſe of the paws, having no reſem-'blance to mankind. All the ſpecies of this genus, except 'one which is very little known, inhabit the torrid regions 'of Aſia and Africa.' KERR'S LINN. p. 83.

SIMIÆ; OR, APES.

In this genus are included apes without tails, baboons with ſhort tails, monkeys with long tails and cheek pouches;

number of generations attain to the original purity of either of its anceſtors. The fact ſeems to be, that in a few generations if it be confined to one kind only, the offspring is not to be diſtinguiſhed from thoſe of that kind.

all which are inhabitants of the old continent; and the ſapajous with prehenſile tails, and ſagouins with long tails and no cheek-pouches; both which are inhabitants of the new continent. The apes without tails are divided by ſome into two claſſes; thoſe that walk conſtantly in an erect poſition, as ſome orang-outangs, and thoſe that walk occaſionally on all four.

The ſpecies of *ſimiæ* are more numerous than of any other animals, there being no fewer than 84. They are moſtly confined to the torrid zone, a ſingle ſpecies only being found beyond the tropic, in Barbary. They are alſo for the moſt part gregarious, and herd together in vaſt companies; but the different ſpecies never mix with each other. Some apes, as likewiſe the maucauco, the bat, and the urchin, go together in pairs; a male and female entering into a monogamious ſociety, and rearing their young ones by a joint concern. *Simiæ* have a greater reſemblance to man in their external and internal form, and in all their actions and faculties, than any other creatures.

None of the genera of animals above mentioned exhibit ſo complete a gradation as the *ſimiæ*. We meet with ſome of an upright poſition of body, and others of an horizontal one; ſome have their face nearly in the ſame line as their body, others have the long projecting horizontal ſnout of the ferocious animals. There are bimanus and bipeds,

quadrumanus and quadrupeds: the deſcent in this reſpect is ſo gentle, that Dr. *Tyſon*'s pigmy, when it walked as a quadruped, reſted upon its knuckles, and never touched the ground with the palms of its hands. Some apes, baboons, and monkies have regular catamenia*; ſapajous and ſagouins have no ſuch diſcharge. There is a wonderful variety in the tails of this genus: ſome have tails twice as long as their bodies, and prehenſile, that is adapted to lay hold of objects as a hand; others again have none at all. The magot, or Barbary ape, ſerves as a link to connect the apes and baboons: it has a ſmall portion of ſkin at the rump which gives it the appearance of a tail. The next is the little baboon; one of which I have ſeen whoſe tail was not an inch long. After this comes the creſted baboon, whoſe tail is ſeven inches long. The *ſimia nemeſtrina*, or pig-tailed baboon, in like manner forms a link between the baboons and monkies. The douc is an animal allied to the monkies, but at the ſame time has ſome reſemblance to the ſapajous.†

Mr. *John Hunter*, in his obſervations on certain parts of the animal œconomy, ſpeaking of the placenta of a monkey,

* Le Gibbon, Le Magot, &c. les femelles ſont comme les femmes, ſujettes a un ecoulement periodique de ſang. *Buffon*, tom. 14.

Simia——femina menſtruat. *Linnæi Syſt. Nat.* tom. 1. p. 25.

† Here it is neceſſary to diſcountenance the opinion of Lord *Monthoddo*, that ſome of the human ſpecies have tails. Were this true, it would break the law of gradation; for, in deſcending through the ſpecies of apes, we meet with no tails till we reach the baboons, which are farther removed from man than the apes are.

ſays, 'the after-birth was preſerved and entire, and was per-
'fectly fit for examination: it conſiſted of placenta, with
'the membranes and navel-ſtring; which all very much
'reſembled the correſponding parts in the human ſubject.'
He likewiſe ſays, 'the female has her regular periods for
'the male; but ſhe has commonly too much complai-
'ſance ever to refuſe him. They carry this ſtill farther;
'for they receive the male when with young, and even when
'pretty far gone. This was the caſe, however, with the one
'I am going to give an account of.'—This circumſtance, I believe, is peculiar to the human race and to ſimiæ.

The human ſpecies and ſimiæ are deſtitute of that ſtrong elaſtic ligament called *pax-wax*, or *tax-wax*, which quadrupeds poſſeſs as a kind of ſtay-tape, to prevent the head from ſinking to the ground. In both, the eye-lids are moveable; but in moſt other animals the upper eye-lid only is capable of movement. The ſimiæ have long fore-arms and flat feet, a large *clitoris* and *penis*, ſmall *teſtes* and *ſcrotum*. The human ſpecies, ſimiæ, ſquirrels, and ſuch other animals as uſe the fore-feet inſtead of hands, have collar-bones, which allow them a more perfect uſe of their limbs in climbing; but when they go on all four, they walk but very indifferently.

Reſpecting the policy of baboons and monkies, travellers inform us, that when thoſe animals are going to ſleep, or about

to commit depredations upon orchards and gardens, they always guard againſt a ſurprize, by appointing one of their body to act as ſentinal, whoſe life is forfeited in caſe of miſconduct or neglect.

It has been thought wonderful that apes, which ſo nearly reſemble man in their organization, and poſſeſs ſuch a remarkable degree of ſagacity, ſhould be totally deſtitute of ſpeech. This circumſtance has been adduced as a proof of their great inferiority to man. Profeſſor *Camper*, however, informs us in a paper publiſhed in the Philoſophical Tranſactions, vol. 69, that he had diſcovered, from the ſtructure of the organ, the real reaſon why the orang-outang, and ſeveral other apes and monkies are unable to ſpeak. He obſerved that the baſis of the *os hyoides* was very large and hollow, and that a membranous bag lying under the *latiſſimi colli* (which touch one another in the middle of the neck in theſe animals) went up into this long cavity, having alſo a communication with the inſide of the *larynx*, by a hole at the root of the *epiglottis*. He ſays, 'Having 'diſſected the whole organ of voice in the orangs, in apes, 'and ſeveral monkies, I have a right to conclude, that o-'rangs and apes are not made to modulate the voice like 'men; for the air paſſing by the *rima glottidis*, is im-'mediately loſt in the ventricles or ventricle of the neck, 'as in apes and monkies, and muſt conſequently return 'from thence without any force and melody within the

‘ throat and mouth of theſe creatures; and this ſeems to
‘ me the moſt evident proof of the incapacity of orangs,
‘ apes, and monkies to utter any modulated voice; as in-
‘ deed they never have been obſerved to do.”*

Naturaliſts have found it difficult to aſſign a reaſon why *America*, when firſt diſcovered by the Europeans, ſhould be inhabited by a race of animals of which the greater part was unknown to the other continent. The fact does not well accord with the opinion of thoſe who imagine that the new world received its inhabitants from the old. That ſome animals common to both, in the colder climates, may have emigrated from one continent to the other, is not improbable: but that none of the inhabitants of the torrid zone in America ſhould be found on the other continent, is a circumſtance totally inexplicable on the hypotheſis of emigration. The ſuppoſition that ſuch animals are now extinct in the eaſtern continent, cannot ſurely be expected to gain any credit.†

* Since the above was written, an opportunity occurred of examining the throat of a monkey, when Dr. Holme was ſo obliging as to aſſiſt Mr. Bennet and my ſon in the diſſection of the animal. Its reſult was a happy confirmation of what Profeſſor Camper had diſcovered. The membranous bags under the *latiſſimi colli*, and a preparation of them, was exhibited to the Society at one of the meetings when this paper was read.

† Jefferſon in his *Notes on the State of Virginia*, page 94, ſpeaking of quadrupeds, ſays, ‘ By theſe it appears there are 100 ſpecies aboriginal of America. Monſ. *De Buffon* ſuppoſes about double that number exiſting on the whole earth.

The colour of ſimiæ does not depend upon climate; for thoſe that inhabit the torrid zone are white as well as black, brown, tawny, yellow, and of many other colours It is remarkable that *ſimiæ* have no lips, at leaſt none that will admit of compariſon with thoſe of mankind; lips being unneceſſary to animals deſtitute of the faculty of ſpeech.

In the Memoirs for a Natural Hiſtory of Animals, firſt publiſhed in French at Paris, it is aſſerted that the clitoris in monkies is proportionably greater and more viſible than in women.

AFTER promiſing theſe general obſervations on the genus Simiæ, I ſhall now ſpeak more particularly of ſome that approach neareſt to man, as the different ſpecies of orang-outang, borrowing from the ſtatements of naturaliſts and travellers an account of the forms, habits, manners, &c. of thoſe animals. — Profeſſor *Gmelin*'s edition of the *Syſtema Naturæ*, as tranſlated by Mr. *Kerr*, deſcribes them as follows:

" Apes. (Simiæ) Have no tails. The viſage is flat; the teeth, hands, fingers, feet, toes, and nails, reſemble thoſe

Of theſe Europe, Aſia, and Africa furniſh (ſuppoſe) 126; that is, the 26 common to Europe and America, and about 100 which are not in America at all. The American ſpecies then are to thoſe in the reſt of the earth as 100 to 126, or as 4 to 5. But the reſidue of the earth being double the extent of America, the exact proportion would have been as 4 to 8.'

of man; and they walk naturally erect. This diviſion includes the ſimiæ, or apes, properly ſo called, of the antients, which are not found in America.

" 1. Chimpanzee.—Simia troglodytes; Great Ape. Has no tail. The head is conical; the whole body is of a robuſt brawny make; the back and ſhoulders are covered with hair, and the reſt of the body is naked. It inhabits *Angola*,* &c.

" 2. Orang-outang—Simia ſatyrus—Homo ſylveſtris, or wild man of the woods.—Has no tail. Is of a ruſty brown colour; the hair on the fore-arms is reverſed, or ſtands upwards; and the buttocks are covered with hair. Inhabits the iſland of *Borneo*. Is about two feet, and walks moſtly erect.

" 3. Pongo—Simia ſatyrus pongo—Homo ſylveſtris; Orang-outang.—Has no tail, no cheek-pouches, and no callofities on the buttocks, which laſt are plump and fleſhy; walks always erect, and is between five and ſix feet high. All the teeth are ſimilar to thoſe of man. The face is flat, naked, and tawny; the ears, hands, feet, breaſt, and belly, are likewiſe naked; the hair of the head deſcends on both temples in the form of treſſes; the hair on the back and

* See Note 4th.

loins is in ſmall quantities. It has not been aſcertained whether the females of this ſpecies or variety, are ſubject to periodical diſcharges; but analogy renders this almoſt unqueſtionable.

" 4. Jocko—Simia ſatyrus Jocko, reſembles the former. The one ſeen by the Count de *Buffon*, was about two feet and a half high, and, by the information of his proprietor, was only about two years old. He walked always erect; his air was melancholy, his gait grave, his movements meaſured, and his diſpoſitions gentle, without any of the miſchievous tricks, impatience, maliciouſneſs or extravagance of other apes, baboons, and monkies. He was remarkably docile and imitative of the actions of mankind, requiring only ſigns and words to make him act, while other apes require to be managed with blows: would preſent his hand to viſiters, ſit down at table, unfolded his napkin, wiped his lips, uſed a ſpoon or a fork, poured his liquor into a glaſs, which he made to touch that of the perſon who drank along with him; would bring a cup and ſaucer to the tea-table, put in ſugar, pour out the tea, and allow it to cool before he drank. He ate almoſt every thing that was offered, but preferred ripe and dried fruits and ſweetmeats; drank a little wine, but frequently left it for milk, tea, or other mild liquors. He was troubled with a cough, lived one ſummer at Paris, and died in London the following winter.

" 5. Great Gibbon—Simia, longimana; Long-armed ape. Inhabits India, particularly Coromandel, Malacca, Sumatra, and the Molucca iſlands. Of a mild and ſlothful diſpoſition, impatient of cold and rain: is about four feet high, of a black colour, with a ſwarthy face, and approaches nearer to the manners of mankind than even the orang-outang; being more inclined to the erect poſture. It is named Golok in India. There are ſlight calloſities on the buttocks. The face is flat, brown, and ſurrounded with a circle of grey hairs: the canine teeth are proportionably longer than thoſe of man: the ears are naked, black, and round: the eyes are large and ſunk: the arms are ſo enormouſly long, that when walking erect he can reach the ground without bending the body. The female has the catamenia. This animal is about three feet high when ſtanding erect, but ſometimes grows to be as tall as a man: it is of a tranquil diſpoſition, and of gentle manners, receiving mildly what is given to it, and feeding, at leaſt in confinement, moſtly on bread, fruits, and almonds."

Profeſſor *Gmelin* mentions the *ſimia naſalis* (ſo called on account of the elegant figure of its noſe) as a newly diſcovered ſpecies of ape, which reſembles mankind more nearly than any other ſpecies hitherto known. He informs us that a particular deſcription of it may be ſpeedily expected from the pen of the celebrated *Daubenton*.

In the 59th vol. of the Philoſophical Tranſactions, there is an abſtract of a letter from *Stephen de Viſne*, Eſq. at Canton in China, in which he ſays, 'Perhaps the drawing which 'I now ſend you of a ſingular ſort of monkies, male and 'female, may not prove unacceptable. Theſe animals are 'called *Golok*, or wild people; and are thought to be ori-'ginally a mixture with the human kind, having no tails. 'They come out of the foreſt in the interior part of Bengal, 'from the country called Mevat. They inhabit the woods; 'their food is fruit, leaves, bark of trees, and milk; fleſh 'only when caught. They are very gentle, and extreme-'ly modeſt. They are of the height of man; their teeth 'are as white as pearls; their legs and arms are in due pro-'portion to their body, which is very genteel. Some of 'them were brought to Decca; and what I now ſend you 'is a copy of the original drawing.'

M. *Gmelin* is of opinion that this is the ſame animal which is deſcribed under No. 4, Jocko, Simia ſatyrus jocko; and *homo ſylveſtris*, orang-outang by Dr. Tyſon, in his anatomy of a pigmy. According to this laſt author, Man and the orang-outang are the only animals that have buttocks and calves of the legs, and who of courſe are formed for walking erect; the only animals who have a broad cheſt, flat ſhoulders, and vertebræ of the ſame ſtructure; the only animals whoſe brain, heart, lungs, liver, ſpleen, ſtomach, and inteſtines are perfectly ſimilar, and who have an appendix

vermiformis, or blind gut. He likewiſe ſays, 'The riſing 'of the cranium juſt under the eye-lids, as I have remarked, 'is different from what it is in man, and renders the face 'harder, as does likewiſe its flat noſe, and the upper jaw 'being more prominent and leſſer ſpread than in man, and 'its chin, or under jaw being ſhorter. The eyes were a 'little ſunk, the mouth large, the teeth perfectly human; 'the face without hair, and the colour a little tawny. The 'ſkin, or the reſt of the body, was white.' Dr. *Tyſon* adds, 'I heard it cry myſelf like a child.'

The female orang-outang of *Bontius** is deſcribed with large pendulous breaſts; and the ſame circumſtance is noted by *Tulpius*†. *Gaſſendus*‡, in the life of *Peireſky*, ſpeaking of the *Barris*, ſaith, *Huic mammæ ad pedis longitudinem.*

All thoſe who have had opportunities of making obſervations on the orang-outangs, agree in aſcribing to them, not only a remarkable docility of diſpoſition, but alſo actions and affections ſimilar to thoſe obſervable in the human kind. — They make themſelves huts for their accommodation; they defend themſelves with ſtones and clubs; and they bury their dead by covering the body with leaves, &c. They diſcover ſigns of modeſty: and inſtances are related of the ſtrongeſt attach-

* Jac. Bontii Hiſt. Nat. & Med. lib. 5. cap. 32. pag. 84.
† Nu. Tulpii Obſerv. Med. lib. 3. cap. 56.
‡ Gaſſen. de Vita Peireſkii, lib. 5. pag. 170.

ment of the male to the female. When ſick, theſe animals have been known to ſuffer themſelves to be blooded, and even to invite the operation; and to ſubmit to other neceſſary treatment, like rational creatures. They groan like the human kind, when under circumſtances of anxiety or oppreſſion: and their ſagacity in avoiding danger, in certain inſtances, is not exceeded by that of man. They have been taught to play upon muſical inſtruments, as the pipe and harp. They have been known to carry off negro-boys, girls, and even women, with a view of making them ſubſervient to their wants as ſlaves, or as objects of brutal paſſion: and it has been aſſerted by ſome, that women have had offspring from ſuch connections. This laſt circumſtance is not, however, certain. Suppoſing it to be true, it would be an object of enquiry, whether ſuch offspring would propagate, or prove to be mules.

Linnæus ſays, the orang-outang lives twenty-five years; likewiſe, that he makes a hiſſing noiſe in ſpeaking. But it muſt be acknowledged, that in ſpeech, if it can be called ſuch, the orang-outang falls far ſhort of the feathered tribe; particularly of parrots, jays, and bullfinches; upon which we ſhall now make a few obſervations.

MAN, conſidered *in toto*, is undoubtedly entitled to pre-eminence over the animal world: but various tribes of crea-

tures make great advances towards him, in ſome particular powers and faculties, and even, in ſome inſtances, far ſurpaſs him. The orang-outang has the perſon, the manner, and the action of man; the parrot, the bullfinch, &c. have ſuch vocal organization as to command the powers of ſpeech, of ſinging, and whiſtling; while the elephant enjoys the faculty of reaſon in an eminent degree.

It is obſervable that no animal, whether bird or quadruped, that approaches near to man in its faculties or energies, has a flat ſkull.——Lavater, ſpeaking of birds, ſays, 'their 'diſtinction of character or gradation of paſſive and active 'powers, is expreſſed by the following phyſiognomical va-'rieties—by the form of the ſkull: the more flat the ſkull, 'the more weak, flexible, tender, and ſenſible is the cha-'racter of the animal. This flatneſs contains leſs, and 'reſiſts leſs.—By the length, breadth, and arching or obli-'quity of their beaks—and here again we find, that where 'there is arching, there is a greater extent of docility and 'capacity.'

The gooſe, which has a flat ſkull and a flat bill, has ſo little ſenſe, that its name is proverbial; but the oſtrich, which has the flatteſt ſkull and the flatteſt bill of all birds, is of all animals, whether birds or quadrupeds, the moſt fooliſh, having no ſenſe that we know of in perfection. It ſeems neither to have the faculty of ſmell, nor of taſte, as it

makes no diſtinctions in food, but will eat its own excrements, or iron nails indiſcriminately. None of the drawings which I have ſeen of this bird are correct; the head being much flatter than they repreſent, and the eyes much larger, and placed higher in the head. In ſhort, it has the flatteſt ſkull of any animal we are acquainted with, the ſmalleſt head in proportion to the body, and the largeſt eyes in proportion to the head; ſo that, owing to the ſmallneſs and flatneſs of the head, and the ſize of the bony ſockets which contain ſuch large eyes, there is very little room for *cerebrum* or *cerebellum*.

The parrot (*pſittacus*) which is of the order of *picæ*, or pies, (ſee KERR's Linnæus) is a genus of birds remarkable for the hookedneſs of their bills, for the largeneſs of their heads, and alſo of the tongue, which is blunt, rounded, and fleſhy. This genus contains numerous ſpecies (according to *Linnæus*, one hundred and ſixty-ſix) and ſeems to form a tribe peculiarly diſtinguiſhed from all others. It may, however, be conſidered as holding the ſame place among birds as that of apes and monkeys does amongſt the *mammalia*. The natural voice of parrots is loud, harſh, and unpleaſant; but they imitate a variety of ſounds, and particularly the human voice, often learning to articulate words with remarkable preciſion. They are chiefly found in the tropical regions: they feed upon nuts, fruits, and ſeeds, and live to a great age.

It would be unneceſſary to relate particular inſtances of the great docility of parrots in acquiring ſpeech, as the fact is generally known. But it ſhould not be underſtood that they are deſtitute of thought and reflection about what they ſpeak, ſince many authentic inſtances might be adduced of having diſcovered much reflection and diſcriminative accuracy in the application of their ſpeech to particular occaſions *. Dr. *Monro* ſays, 'In one ſpecies of bird (the parrot) I long ago remarked that the pupil was affected by 'the paſſions of the mind of the animal, independent of 'the light upon the eye.' *Monro on the Nervous Syſtem*, page 96.—Some ſay, that the tongue of this bird ſomewhat reſembles that of man, and by this conformation they pretend, it is ſo well qualified to imitate the human ſpeech. But the organs by which theſe ſounds are articulated lie farther down in the throat: and the great mobility of the *os hyoides*, which is remarkable in theſe birds, contributes very much to produce the effect.

The raven and the magpie may be taught to ſpeak like the parrot. It is aſſerted that the raven has been taught to ſing a tune like a man. The magpie's voice is too acute and ſharp to imitate the human voice, though it ſhould articulate diſtinctly.

Singing birds, although deſtitute of the power of articulating, are expert in acquiring parts of artificial tunes; in re-

* See note 6.

peating which they attend to the time and the tone with the greateſt nicety. The bullfinch, though not naturally muſical, may, when tamed, be taught to whiſtle any tune; and, in other reſpects, becomes extremely docile. The voice of birds is incomparably louder in proportion to their ſize than that of other animals: thus, the ſcreaming of a peacock is much louder than the bellowing of an ox. In all countries birds exceed quadrupeds in longevity.

Mr. *Jefferſon*, in his *Notes on the State of Virginia*, ſpeaking of the bee not being a native of America, ſays, 'They furniſh then an additional proof of the remarkable 'fact firſt obſerved by the Comte *de Buffon*, and which 'has thrown ſuch a blaze of light on the field of natural 'hiſtory, that no animals are found in both continents, but 'thoſe which are able to bear the cold of thoſe regions 'where they probably join.' *Buffon* alſo obſerves, 'that 'not a ſingle animal of the torrid zone is common to the 'old world and to the new.' To which we may add, that none of the domeſtic animals of Europe were found in America when it was firſt diſcovered.

The obſervation will apply to the human ſpecies alſo; for none were found ſimilar in the two worlds but ſuch as were near the frigid zone, where there was a probability of their communication. There were no negroes, nor European whites to be found in the whole continent of

America; nor any red copper-coloured Indians, either in Europe, Aſia, or Africa. As, therefore, many different ſpecies of animals have been diſcovered in America which were not known either by the antients or moderns ever to have exiſted either in Europe, Aſia, or Africa, how can we ſuppoſe they were placed there, except by the immediate hand of the Almighty Creator of all things? for, if they ever had exiſted in the old world, it is hardly poſſible that they could have been totally exterminated from that quarter of the globe where they were firſt placed.

THE inferences to be drawn from the above facts and obſervations, are theſe:

That there is a general gradation from man through the animal race; from animals to vegetables, and through the whole vegetable ſyſtem. By gradation, I mean the various degrees in the powers, faculties, and organization. The gradation from man to animals is not by one way; the perſon and actions deſcend to the orang-outang, but the voice to birds, as has been obſerved.

That there are many quadrupeds, inſects, birds, and fiſhes, which appear to be created for particular climates, and cannot live in any other.

That many animals and vegetables exiſt in the old world, which were not found in the new one, when diſcovered by *Columbus*; and that there are many animals and vegetables found in the new world, which were never known in the old.

Laſtly, that thoſe animals which were common to both worlds, were only to be met with in the northern hemiſphere, in which the new and old world had probably communications near the north pole. Theſe animals were about twenty-ſix in number.

PART SECOND.

ON THE GRADATION IN MAN.

I SHALL now endeavour to prove the general gradation in man, the chief and lord of the creation. The hint that ſuggeſted this inveſtigation, was taken, as has been obſerved, from Mr. *John Hunter*, who had a number of ſkulls, which he placed upon a table in a regular ſeries, firſt ſhewing the human ſkull, with its varieties, in the European, the Aſiatic, the American, the African; then proceeding to the ſkull of a monkey, and ſo on to that of a dog; in order to demonſtrate the gradation both in the ſkulls, and in the upper and lower jaws. On viewing this range, the ſteps were ſo exceedingly gradual and regular, that it could not be ſaid that the firſt differed from the ſecond more than the ſecond from the third, and ſo on to the end*. Upon conſidering what Mr. *Hunter* thus demonſtrated reſpecting ſkulls, it occurred to me that Nature would not employ gradation in one inſtance only, but would adopt it as a general principle. I had obſerved that the arms were longer, and the feet flatter

* See note 7.

in apes than in the human ſpecies; and, having the ſkeleton of a negro amongſt others in my muſeum, I meaſured the radius and ulna, and found them nearly an inch longer than in the European ſkeleton of the ſame ſtature. The foot of the negro I perceived to be much flatter: the *os calcis* alſo differed from that of the European both in length, breadth, ſhape, and poſition, not forming an arch with the tarſal bones, but making with them nearly a ſtraight horizontal line.——(A drawing of the foot of the negro ſkeleton may be ſeen in plate 1.)—Theſe remarks encouraged me to proceed in my inveſtigation. I did not carry my enquiries into provincial or national varieties or features, but confined them chiefly to the extremes of the human race: to the European, on the one hand, and, on the other, to the African, who ſeems to approach nearer to the brute creation than any other of the human ſpecies. I was perſuaded, that if I could prove a ſpecific diſtinction betwixt theſe two, the intermediate gradations would be more eaſily allowed.

I next examined the ſkull, and found the frontal and occipital bones narrower in the negro than in the European; the *foramen magnum* of the occipital bone ſituated more backward, and the occipital bone itſelf pointing upwards, and forming a more obtuſe angle with the ſpine in the former, than in the latter. The internal capacity of the ſkull was leſs in the former; and the fore parts of the upper and lower jaw, where they meet, were conſiderably

more prominent. In the negro, the depth of the lower jaw, betwixt the teeth and the chin, was leſs; and that of the upper, betwixt the noſe and the teeth, was greater: the diſtance from the back part of the *occiput* to the *meatus auditorius* was leſs, and from thence to the fore teeth was greater. The fore teeth were larger, not placed ſo perpendicularly in their ſockets, and projecting more at their points than in Europeans: the angle of the lower jaw was nearer to a right angle, and the whole apparatus for maſtication was ſtronger. The bones of the noſe projected leſs. The chin, inſtead of projecting, receded. The *meatus auditorius* was wider. The bony ſockets, which contained the eyes, were more capacious. The bones of the leg and thigh more gibbous: and, by the marks which were left upon the ſkull, it plainly appeared that the temporal muſcles had been much larger.—In all theſe points it differed from the European, and approached to the ape.

I wiſh it to be particularly underſtood that I conſider the chin of the negro as deſerving peculiar attention. This part has either not been properly characteriſed, or the account has been much underſtood. It is ſaid by ſome that the chin of the negro projects: the reverſe, however, is the fact; for, beſide that the diſtance of the fore teeth from the bottom of the chin is leſs than in the European, the lower part of the chin, inſtead of projecting outward, retreats, or falls back, as in the ape.

In the annexed table are the meaſurements of nine European ſkeletons, of a negro ſkeleton, of Dr. *Tyſon*'s pigmy, and of a monkey, ſhewing the ſtature of each, the length of the *os humeri* and of the *ulna*. The ſkeletons are none of them ſelected; but are all that I have been able to find, in Mancheſter, that are complete in the bones only. The table likewiſe contains a comparative account of the ſame particulars in living ſubjects, whites and negroes, of which an explanation will follow.

SKELETONS.

	Mr. White's female European.		Mr. Ward's male ditto.		Mr. Wood's male ditto.		Mr. Nanfan's male ditto.		Mr. Wood's 2d male ditto.		Mr. Longworth's female ditto.		Mr. Crofier's female ditto.		Mr. Foxley's male ditto.		Manchefter Infirmary female ditto.		Mr. White's male uegro.		Dr. Tyfon's pigmy male.		Mr. White's monkey.	
	F.	I.	F.	I.	F.	I.	F.	I.	F.	I.	F.	I.	F.	I.	F.	I.	F.	I.	F.	I.	F.	I.	F.	I.
Stature,	5	8 1/2	5	8	5	7	5	5 1/2	5	5	5	4	5	3 1/8	5	1 3/8	4	11	4	11 1/2	1	9	2	2
Os humeri,		12 1/2		13		12 1/4		13		12 1/2		12		12 3/8		12 1/2		11		11		5 1/2		4 1/4
Ulna,		10		9 7/8		9 3/4		10 3/8		10		9 1/2		10		10 1/4		9		9 7/8		5 1/2		5
Living Negroes.	Lunatic Hofpital, Liverpool.		Glazier from the Gold Coaft.		John Gilman, St. a Cruz.		Spotted, or Blotched Jamaica.		Tho. Rogers, Long Iſland, mother tawney.		Jamaica Regiment of Dragoons.		Wm Layland, Anamabol.		North Virginia.		Caſtleman, Jamaica.		Ld. G. de Wilton's Royal Lancaſhire Anamabol.		Barbadoes.		Henry John.	
Stature,	5	10 1/2	5	8	5	8	5	7	5	6	5	6	5	6	5	5 1/2	5	4 3/4	5	4 1/4	5	1 3/4	5	0
Upper arm,		15		13		13 3/4		13		13		12 3/4		12 1/4		13 1/2		12		12 1/2		13		12
Fore arm,		12 3/4		12 1/4		11 3/4		11		11		10 3/4		11		11 3/4		11		10 1/2		11		10 1/2
	No frenum.						No frenum.		No frenum.														No frenum.	
White Europeans.	Mr. W.'s Butler.		Mr. W.'s Gardener.		Mr. W.'s Coachman.		Mr. W.'s Footman.		Apothecary Lying-in Hofpital.		Mr. B.		Mr. J. B. W.		Mr. W.		Dr. T.		Jarvis, Hair-dreſſer.		Houſe Surgeon, Infirmary.		Porter Lying-in Hofpital.	
Stature,	5	11 1/2	5	9 1/2	5	8	5	8	5	7 1/2	5	7 1/2	5	7 1/4	5	7	5	5 3/4	5	5 1/2	5	4 1/4	5	0
Upper arm		15		14		13 1/2		13 1/2		13 1/2		13 1/4		12 3/4		12 3/4		12 1/2		13 5/8		12 5/8		12 1/4
Fore arm,		11		11		10 1/2		10 6/10		10 1/2		10 1/4		10		10		9 7/8		10 1/4		10 1/10		0 3/8

The following meaſurements were taken from three of the talleſt ſoldiers in Captain HORTON's grenadier company of Royal Lancaſhire Volunteers.

GRENADIERS	Daniel Lees,		Robert Lees,		John Shepley,	
	F.	IN.	F.	IN.	F.	IN.
Stature,	6	4 1/2	6	1	6	0
Upper arm,		16		15 1/2		15
Fore arm,		12 1/4		11 5/8		11 3/8

	John Harris,		Joſeph Bamford,		James Peatfield,	
	F.	IN.	F.	IN.	F.	IN.
Stature,	6	3 1/2	6	2	6	2 1/4
Upper arm,		15 1/4		15 1/4		15 1/4
Fore arm,		11 3/4		11 1/4		11 1/2

	John Lee, (a Laſcar)		A tawney woman,		Caſt of the Jew at Somerſet-houſe.	
	F.	IN.	F	IN.	F.	IN.
Stature,	5	4	5	4	5	8
Upper arm,		12 3/4		12		14 1/2
Fore arm,		10 1/2		10 1/4		11

	Venus de Medicis,		European women,		European women,	
	F.	IN.	F.	IN.	F.	IN.
Stature,	5	0	5	4	5	0
Upper arm,		13 1/2		13		12 1/4
Fore arm,		9 3/4		9 3/4		8 3/4

Lavater, ſpeaking of the difference of ſkulls relatively to ſexes and nations, ſays, 'the ſkull of a Dutchman is more 'rounded, in every ſenſe; the bones of it are broader,— 'more uniform,—have fewer curves,—and, in general, 'have the form of an arch, leſs flattened at the ſides.

'The ſkull of a Calmuck has an appearance much more 'rude and coarſe; it is flattened at the top, prominent at 'the ſides, and at the ſame time firm and compact: the 'face is broad and flat.

'That of the Ethiopian is erect and ſtiff, ſuddenly nar- 'rowed towards the top, ſharpened above the eyes, pro- 'jecting below, elevated and globular in the hinder part.

'The forehead of the Calmuck is flat and low; that of 'the Ethiopian higher, and more ſharpened: and in Eu- 'ropeans, the vault of the hind head is more arched and 'rounded, in form of a globe, than in the negro and the 'African in general.'

Lavater gives us a plate with engravings of ſkulls be- longing to the ſubjects of different nations.

'1. That of a German. Every thing about it bears 'the impreſs of an European head, and it ſenſibly differs 'from the three which follow. The hinder part is thick-

‘ er, the fore part more ſlender; the forehead, better
‘ arched than the others, is neither too ſtraight nor too
‘ round.

‘ 2. Is the ſkull of an Eaſt Indian. It is eaſily diſtin-
‘ guiſhable from the firſt: The crown of the head is more
‘ pointed, the hind head more ſhortened, the bones of the
‘ jaw and the whole face infinitely thicker.

‘ 3. That of the African differs from both of the pre-
‘ ceding in the hind head, which is much narrower, and
‘ by the ſize of the bone which ſerves for its baſe: beſides,
‘ the bone of the noſe is too ſhort, and the ſockets of the
‘ teeth advance too much; hence that little flat noſe, and
‘ thoſe thick lips, which are natural to all the nations of
‘ Africa. I am particularly ſtruck with the ſenſible diſpro-
‘ portion between the forehead and the reſt of the profile.
‘ That excepted, the arch of the forehead conſidered by
‘ itſelf, bears not that character of ſtupidity which is mani-
‘ feſt in the other parts of the head.

‘ 4. The Nomade Tartar, or Calmuc. The forehead
‘ has a reſemblance to that of the monkey, not by its ſitu-
‘ ation, but by its flatneſs. The orbits of the eyes are
‘ very much ſunk, and the bone of the noſe ſo ſhort, and
‘ ſo flat, that it ſcarcely projects beyond the adjoining
‘ bones. That of the chin is more pointed and promi-

'nent, but at the ſame time ſo ſmall, that it produces, in 'the whole, an outline bending inward, the effect of which 'is very diſagreeable.'

Again—*Lavater* ſays, 'It muſt have been already re-'marked, that I take the ſyſtem of the bones as the great 'outline of man, the skull as the principal part of that ſyſ-'tem, and that I conſider what is added almoſt as the co-'louring of this drawing; that I pay more attention to the 'form and arching of the skull, as far as I am acquainted 'with it, than all my predeceſſors; and that I have conſi-'dered this moſt firm, leaſt changeable, and far beſt de-'fined part of the human body, as the foundation of the 'ſcience of Phyſiognomy.'

He asks, 'Which are in general the weakeſt animals, and 'the moſt remote from humanity? the moſt incapable of 'human ideas and ſenſations? Beyond all doubt, thoſe 'which in their form leaſt reſemble man.'

Lavater frequently dwells upon the forehead, the noſe, and the chin; which he conceives to be the three leading features. He asks, What care of education can arch the skull of a negro, like that of a ſtar-converſant aſtronomer?

Speaking of the monkey, he ſays, 'Brutal inferiority to 'man is eſpecially to be ſought——in the ſhortneſs of the

'forehead, which is far from having the beautiful proportions of the human; and, accurately ſpeaking, is no forehead: a flat forehead is as great a ſoleciſm as it would be to ſay a horizontal perpendicular—in the noſe, ſmall above, flat below, and not prominent—in the deſcent from the noſe to the mouth, which is nearly as long as the chin, or the part which correſponds to the chin;—whereas, in man, it has uſually only half the length of the chin. The chin of man is more projecting; the chin of the monkey is ſo far back, that if a man's ſkull and a monkey's be placed upon a table, reſting on the chin, the latter can ſcarcely be perceived to have any.'

He obſerves, 'I believe it may be received as a phyſiognomical axiom, that the more chin the more man, ſo long as it bears a proportion to the noſe: I ſpeak not of fleſhy, but bony chins. Hence, ſcarcely any beaſt viewed in front has chin. Hence the retreating chin and the retreating forehead generally accompany each other.—Particularly viſible in profile is the form and ſize of the back of the head; how much more lengthened and depreſſed than that of man is the monkey's! The angle formed by the back part of the under jaw and the line of the bottom of the head, is nearly a right one.'

Profeſſor *Camper* ſays, 'From the moment in which I was in poſſeſſion of the head of a negro and that of a

'Calmuck, I desired nothing so much as to compare these 'two heads with that of an European, and to unite with 'them the head of a monkey; the result of this comparison 'was a discovery, that a line drawn from the forehead to 'the upper lip would demonstrate the difference betwixt the 'faces of different nations, and likewise the resemblance 'betwixt the head of a negro and that of a monkey.— 'Taking with great care a sketch of each of these faces 'upon an horizontal line, I traced the facial lines, follow- 'ing the angles which they made with the line horizontal. 'As soon as I brought the line of the face forward, I had 'the head of an antique; if I inclined it backward, I had 'the head of a negro; a little farther back, it presented the 'head of a monkey; still farther, that of a dog; and lastly, 'that of a woodcock—and in this consists the basis of my 'edifice*.'

* The facial line of a monkey makes an angle of 42°, with the horizontal line; that of an orang-outang, 58°; that of a negro, 70°; of a Chinese, 75°; of an European, 80 or 90°. The Roman painters preferred the angle of 95°; the Grecian antique, 100°. If above 100°, it begins to grow monstrous, and with a greater angle the head must resemble that of a child labouring under a hydrocephalus.

So far, according to *Camper*.—But perhaps the angle made by the facial line may be estimated as follows: That of the European, from 90 to 80°; of the Asiatic, from 80 to 75°; (I have seen an Asiatic whose facial line appeared to me to be near 80°)—of the American, from 75 to 70°; of the African negro, from 70 to 60°; of the orang, from 60 to 50°; of the common monkey, from 50 to 40°. It is less in the dog, and still more so in birds.—There is, therefore, a perfect and regular gradation in the inclination of the face, from the perpendicular line of the European man, to the horizontal one of the snipe or woodcock; in which last there is no room in the jaws for teeth.

But, to return to my own observations. After having compared my negro ſkeleton with the European, I was obliged to purſue the compariſon with a great number of living ſubjects, before any fair induction could be obtained. Accordingly, I meaſured the arms of about fifty negroes;—men, women, and children, born in very different climates; and found the lower arm longer than in Europeans, in proportion to the upper arm and to the height of the body.—The preceding table contains the meaſures of the firſt twelve negroes I met with, and alſo of the firſt twelve Europeans, of nearly correſponding ſtature that I meaſured, beginning with thoſe of my own family; ſo that no ſelection was made in either caſe for the purpoſe of ſerving an hypotheſis. I took the following method to measure the fore arm. I applied a pair of callipers to the extremity of the elbow, and to the lower extremity of the *ulna,* where it is joined to the wriſt; by which the length may be accurately obtained. But it is not ſo eaſy to find the length of the *os humeri* in a living ſubject. I contented myſelf with applying one end of the callipers to the extremity of the elbow, and the other end juſt below the *acromion:* the diſtance gave the length of the *os humeri,* together with the thickneſs of the *ulna,* at its upper part; but, as all were meaſured in the ſame manner, this circumſtance is immaterial. By a careful admeaſurement I found, that, not only in the twelve, but in *all* the negroes, the length of the lower arm was greater than in thoſe of Europeans correſponding in

ſtature. I am informed, however, of a negro ſkeleton in St. *Bartholomew*'s Hoſpital, in which the *radius* and *ulna* are no longer than the medium of Europeans: But as Africans, as well as Europeans, are liable to ſome variation in this particular, one or two exceptions have no force againſt the general inference.

Living ſubjects are always more to be depended upon than ſkeletons, for two reaſons: firſt, the bones may be changed in preparing or in mounting them; and, ſecondly, the ſtature of the ſkeleton is entirely governed by the manner of putting together the bones of the ſpine.

The firſt negro on the liſt, is one in the Lunatic Hoſpital in Liverpool. His fore arm meaſures twelve inches and three quarters, and his ſtature is only five feet ten inches and a half. I have meaſured a great number of white people, from that size up to ſix feet four inches and a half; and, amongſt them, one who was ſaid to have the longeſt arms of any man in England; but none had a fore arm nearly equal to that of the black lunatic.

I meaſured the lunatic myſelf, in the preſence of ſeveral gentlemen of the faculty, at the Hoſpital; but after my return from thence, finding the meaſure of the arm to exceed all others ſo much, I was afraid of a miſtake; and wrote to a medical man of the Infirmary, deſiring the lunatic might

be meaſured again. This was done; and two pupils at the Infirmary ſent me a note, of which the following is a copy:

	F.	IN.
" Height of the BLACK at the Aſylum, ...	5	$10\frac{1}{2}$
" Length of the *humerus*, ...		15
" Length of the *ulna*, ...		$12\frac{3}{4}$

" 11*th April*, 1794. " RICH. FORSHAW,
" THO. CHRISTIAN."

I have meaſured the arms of a great number of European skeletons, and have found that the *os humeri*, or upper arm, exceeds in length the *ulna*, which is the longer bone of the fore arm, by two or three inches; in none by leſs than two, and in one by not leſs than three inches and one eighth. In my negro skeleton, the *os humeri* is only one inch and one eighth longer than the *ulna*. In Dr. *Tyſon*'s pigmy, the *os humeri* and *ulna* were of the ſame length; and in my skeleton of a common monkey, the *ulna* is three quarters of an inch longer than the *os humeri*: ſo that, in reſpect to the fore arm, the gradation is as regular as poſſible.

I next examined the feet of living blacks, of men, women, and children, born in Liverpool, and clothed and educated as the other natives of that town are; theſe I found to be flatter than in Europeans. There was a difference alſo in other particulars; the bones of their thighs and legs were gibbous on the fore part; their fingers and toes were longer and ſmaller, but the thumb appeared ſhorter and

ſmaller. Upon the whole, therefore, I think it cannot be doubted, that, from whatever cauſe it may ariſe, there actually ſubſiſts a characteriſtic difference in the bony ſyſtem, betwixt the European and the African. This difference exiſts in the skull, in the ſockets for the eyes, in the noſe, in the chin, in both the upper and lower jaws, and in the poſition of the head upon the ſpine; alſo in the length of the fore arm, in the feet, and in the legs and thighs *.

Profeſſor *Camper* was decidedly of opinion, that the whole human race deſcended from a ſingle pair, and that all the varieties were occaſioned by climate, nutrition, air, &c. 'But (ſays he) how theſe operate, and why the upper *maxilla* of a negro and the cheek bones of a Calmuck project, and why the ſocket of the eye is lower and more oblique in a Chineſe and a Moluccan, cannot be fully explained.' But what would he have ſaid, if he had known that the lower arm of the African was conſiderably longer than that of the European, though there ſeems to be no difference in the length of the upper arm, the leg, or the thigh? He very juſtly explodes the idea of the heads, noſes, and jaws of negro children being modified by abſurd cuſtoms of their parents. Some perſons have ſuppoſed that the mouth, being expoſed to the influence of climate more than ſome other parts, might be more luxuriant in hot

* Some differences in different ſubjects, relative to the number of the *vertebræ* of the loins, have been obſerved by anatomiſts. See Note 7.

countries; but we find mouths of the ſame form in the frigid zone. Beſides, were the above ſuppoſition admitted, we ſhould expect to find the noſe and the chin enlarged for the ſame reaſon; whereas, the very reverſe is the caſe, the noſe being ſhorter, and the chin alſo ſhorter and leſs prominent. And if it ſhould be alleged that the fore arm might be longer, from the ſame cauſe, why not the upper arm, the leg, and the thigh alſo?

Were we to look over the world at large, and take into conſideration the numerous varieties which would be preſented to us in reſpect to the bones, it would probably appear, that ſeveral tribes reſembled the European, in many particulars, but that none of them united all his characteriſtics; the arched hind-head and fore-head, the prominent noſe, the round projecting chin and flat mouth, the ſame facial line, and the ſhort fore arm, being not known to exiſt together in any other quarter of the world. Whatever deviations from theſe are found to take place, they are generally in the line of gradation from the European man down to the ape.

Having endeavoured to eſtabliſh and illuſtrate the fact of a gradation from the European man to the brute, in reſpect to the bones, being that part of the ſyſtem allowed to be leaſt affected by climate, diet, cuſtoms, &c. we will now proceed to ſhew that a ſimilar gradation takes place in the cartilages, muſcles, tendons, ſkin, hair, ſweat, catamenia, rank

ſmell and heat of the body, duration of life, teſtes, ſcrotum, and *frænum præputii*, *clitoris*, *nymphæ* and *mammæ*, ſize of the brain, reaſon, ſpeech and language, ſenſe of feeling, parturition, diſeaſes, and manner of walking; and likewiſe that a gradation takes place in the ſenſes of hearing, ſeeing, and ſmelling; in memory, and the powers of maſtication: but in theſe laſt particulars the order is changed, the European being the loweſt, the African higher, and the brute creation ſtill higher in the ſcale.

With regard to the cartilages, muſcles, and tendons, we are not in poſſeſſion of a ſufficient number of comparative anatomical facts to allow us to ſtate much. The cartilage of the noſe in the negro is much broader than in the European, and ſtill broader in the ape. The gaſtrocnemii muſcles are ſmaller, and placed higher in the African than in the European; they are ſtill ſmaller and higher in the orang-outang: in the monkey thoſe muſcles are totally wanting. The temporal muſcles are larger in the African than in the European, and ſtill larger in apes. The *tendo achillis* is longer in the African than in the European, and ſtill longer in the ape.

The SKIN, including the *epidermis* and *rete mucoſum*, is well known to be thicker in the African than in the Europeans, and ſtill thicker in monkeys.

The HAIR of the head, chin, &c. is ſhorter and more woolly in the African than in the European, and ſtill more ſo in monkeys.

The SWEAT.—Captains and Surgeons of Guinea ſhips, and the Weſt India planters, unanimouſly concur in their accounts, that negroes ſweat much leſs than Europeans; a drop of ſweat being ſcarcely ever ſeen upon them. Simiæ ſweat ſtill leſs, and dogs not at all. As to inſenſible perſpiration, I do not know how the fact ſtands; probably it is leſs in negroes, owing to the thickneſs of their ſkins: and the conſequence may be a greater exhalation of moiſture from the lungs.

CATAMENIA.—It is the general opinion of phyſiologiſts, that females menſtruate in larger quantities in warm climates than in cold; twenty-four ounces being the quantity in the warmeſt climates, eighteen ounces in Greece, from ten to four in this country, and two ounces in the coldeſt, as Lapland. This may be true in Europeans, and in Creoles born of European parents, but I believe it is much otherwiſe in negreſſes.—Dr. *Spaarman*, the Swediſh naturaliſt, who went to make diſcoveries in Africa, informs us, that thoſe periods are much leſs troubleſome to the female ſex in Africa than in Europe. The fact has been confirmed to me by the teſtimony of many Planters, as well as of Captains and Surgeons of Guinea ſhips, who have had the fulleſt opportuni-

ties for obſervation. Apes and baboons menſtruate leſs than negreſſes, monkeys ſtill leſs, and ſapajous and ſagouins not at all.

The RANK SMELL emitted from the bodies of many negroes is well known; but it is much ſtronger in ſome tribes or nations than in others, and the ſtrongeſt in apes.

HEAT.—This may be conſidered in two points of view; the capability of perſons ſuſtaining a warm or cold climate, and the natural temperatures of their bodies as indicated by a thermometer. As to the firſt, Dr. *Spaarman*, ſpeaking of the Africans, ſays—'Though they did not appear of a chilly 'nature, they never ſhewed the leaſt ſigns of being diſ-'pleaſed with the hotteſt days of ſummer.' Weſt India planters have aſſured me, and all writers agree, that the negroes in the Weſt Indies ſuffer more from the cold and moiſt weather, than from the warm and dry: cold renders them languid and diſpirited, but heat revivifies them.—Their infants are ſo ſenſible of the impreſſions of cold air, that they are obliged to be kept for the firſt nine days after birth in cloſe warm chambers. If this precaution be neglected, they are liable to be affected with the *tetanus*, or locked jaw, which generally proves fatal to them. It is allowed that the creole negroes ſuſtain the extremes of heat much better than the creole whites. On the other hand, when the blacks are tranſported into theſe colder climates,

they ſeem to ſuffer more than we do from cold. I myſelf have known inſtances where negroes have loſt their toes by the froſt, in circumſtances wherein an European would not have ſuffered. Conſiſtently with this, we find that the whole genus of ſimia is impatient of cold; and no orang-outang has ever yet been able to bear the cold of many European winters ——With regard to heat, in the ſecond point of view, it has been ſaid that negroes are two degrees colder than Europeans. The practice of the luxurious Turk gives countenance to this, as he prefers a negreſs for ſummer, a fair Circaſſian for ſpring and autumn, and an European brunette for winter.

Duration of life.—Negroes are ſhorter lived than Europeans. All obſervations confirm the fact, that the children of negroes are more early and forward in walking than thoſe of Europeans; likewiſe that they arrive at maturity ſooner. The males are often ripe for marriage at ten, and the females at eight years of age. Now, it is a general principle in natural hiſtory, that the more early any ſpecies of animals arrive at maturity, the ſhorter is the natural period of their life.

Citius pubeſcunt, citius ſeneſcunt.

In conformity with this principle, we find that negroes rarely attain to the longevity of Europeans. Lieutenant *Patterſon*, in his account of the *Caffres*, mentions one of ninety years

as a very rare phenomenon. Moſt other travellers concur in obſerving, that negroes and Hottentots of fifty are reckoned very old men; and that at forty they become wrinkled, and diſcover every other mark of old age, notwithſtanding they may have vigorous conſtitutions, and be free from diſeaſe. In this reſpect, therefore, gradation is apparent; for, according to *Linnaeus*, the orang-outang lives only twenty-five years.

That the PENIS of an African is larger than that of an European, has, I believe, been ſhewn in every anatomical ſchool in London. Preparations of them are preſerved in moſt anatomical muſeums; and I have one in mine. I have examined ſeveral living negroes, and found it invariably to be the caſe. A Surgeon of reputation informs me, that about forty years ago, when he was pupil to the late *William Bromfeild*, Eſq. he aſſiſted at the diſſection of a negro, whoſe *penis* was *ad longitudinem pollicum duodecim*. It was preſerved and depoſited in Mr. *Bromfeild*'s muſeum. *Haller*, in his *primæ Liniæ*, ſpeaking of the Africans, ſays, '*In ho-* '*minibus etiam penis eſt longior & multo laxior*;' but I ſay, *Multo firmior & durior*. In *ſimiæ* the *penis* is ſtill longer, in proportion to the ſize of their bodies.

I found with ſome ſurpriſe, that, the TESTES and SCROTUM are leſs in the African than in the European. They are ſtill leſs, proportionally, in the ape. That the

penis ſhould be larger, and the *teſtes* and *ſcrotum* ſmaller, in the order thus ſtated is another remarkable inſtance of gradation.

FRAENUM PRAEPUTII.—I have examined twelve negroes, who had not been circumciſed, but had the *praeputium* complete and large, and in four of them there was no *fraenum praeputii*, nor the leaſt preparation for one, nor any ſign of their ever having had any; there was no appearance of ulceration or inciſion having taken place; and, upon the ſtricteſt enquiry, I could not find that any ſuch thing had happened *. Six of them had very trifling ones, which hardly could be called bridles: the remaining two were as perfect as Europeans.

CLITORIS and NYMPHAE.—Dr. *Spaarman*, ſpeaking of the then prevalent opinion that the Hottentot women have a kind of natural veil which covers the ſexual parts, ſays, 'The women have no parts uncommon to the reſt of the 'ſex; but the *clitoris* and *nymphae*, particularly of thoſe 'who are paſt their youth, are much elongated.' This has been confirmed to me by ſeveral ſurgeons of Guineaſhips; and, from the obſervations upon the *penis* given

* I had ſince an opportunity of examining only one of the ſons of theſe four, (Thomas Rogers's—ſee the preceding table) and he had no *frænum præputii*.—This boy was only four years old: a convincing proof that the *frænum* was not deſtroyed by any venereal complaint.

above, analogy ſeems to require it. Notwithſtanding this, it may be obſerved, that in the four or five inſtances I had occaſion to examine, there was no material difference from Europeans diſcoverable.—In the females of the ape and the dog, the *clitoris* is ſtill longer.

MAMMAE.—We are informed by Drs. *Thunberg* and *Spaarman*, that the Hottentot women have long flabby breaſts; and that they can ſuckle their children upon their backs, by throwing the breaſt over their ſhoulders. Monſ. *Buffon* ſays the ſame of the women of Greenland; and further, 'that their nipples are as black as jet, and their ſkin 'of a deep olive colour; and it is ſaid that ſome of them 'are as black as the Ethiopian.' Long flabby breaſts, therefore, are not the effect of relaxation in a warm climate, but are found with people of colour in the frigid as well as torrid zone. No European white woman, however, in any age or climate, was ever known to have a breaſt of ſuch deſcription. The African, therefore, in this particular approaches to the ſimia.—*Long*, in his Hiſtory of Jamaica, ſays, 'Negreſſes have larger nipples than Europeans.'—— Brutes have ſtill larger nipples.

SIZE OF THE BRAIN. REASON.—The cavity of the ſkull, which contains both *cerebrum* and *cerebellum*, is leſs capacious in the African than in the European, and ſtill leſs in the brute ſpecies. All the nations of Africa, and the inha-

bitants of the ſouthern iſles have either very narrow ſkulls, the two parietal bones approaching near to each other; or they have a flat, receding forehead, and hind-head: and the bony ſockets which contain the eyes, are more capacious than thoſe of Europeans. It has been obſerved already, that man has the largeſt brain of any animal; and, of all men, the European has the largeſt; yet ſome animals poſſeſs a larger brain in proportion to their body; as mice, ſquirrels, &c. and ſome birds.

We know ſo little of the phyſiology of the brain and nerves, that I ſhall not ſtate much concerning them.—— It ſhould ſeem, however, from the obſervations made upon man, the elephant, and other creatures, that, generally ſpeaking, thoſe animals which have a greater quantity of brain, have alſo more reaſon, or ſagacity. Mr. *John Hunter*, who, it muſt be allowed, was as capable as any man of examining the *interior* of the elephant's head, and who had opportunities of diſſecting no fewer than three elephants that belonged to the Queen, preſerved and arranged the brains of different animals, upon which his editor remarks: ‘ In the inſect the brain has a more compact form,--- is ‘ larger in fiſh,--- but ſtill more ſo in birds,--- gradually ‘ advancing in ſize, as the animal is endowed with a ‘ greater degree of ſagacity, till at laſt it becomes the large ‘ complex organ found in the elephant and in the human ‘ ſubject.’——On the other hand, *Lavater*, who ſeems to

have been equally attentive in examining the *exterior* of the elephant's head, when ſpeaking of that animal, diſcovers 'his retentive memory in the ſize and arching of his 'forehead, which approaches nearer to the outline of the 'human forehead than that of any other beaſt.' *Vol.* 2. *page* 174.

Again—'Superior to all is diſtinguiſhed the elephant, 'by an increaſe of ſkull, alike in the back part and in the 'forehead. How true, how natural an expreſſion of wiſ-'dom, power, and delicacy!' *Page* 159.

It has been cuſtomary to diſtinguiſh, by the name of *inſtinct*, the ruling principle in animals, from *reaſon* in man: but it is much more probable that *inſtinct* and *reaſon* are only different degrees of the ſame principle. It can ſcarcely be denied, that "man differs more from man, than man from beaſt."—Whether it proceeds from a difference in the quantity of brain, or from any other ſource, there ſeems a difference in the original capacity of the different tribes of mankind. We ſhall ſtate the opinions of two or three intelligent obſervers on this head.

Dr. *Thunberg* ſays, 'It may indeed be alleged, that the 'inhabitants of the warmer climates have a dull torpid brain, 'and are leſs keen and ſharp than the Europeans. They 'have a power of thinking, but not profoundly, and con-

'ſequently converſation among them is rather triſling.—
'They are, in general, idle, ſleepy, heavy, and laſcivious.
'To theſe qualities, the heat of the climate itſelf inclines
'them; and, without inſulting the dark brown inhabitants
'of the Eaſt Indies, one may truly ſay that there is a greater
'difference between them and the Europeans, than between
'the monkeys and them.'

Mr. *Jefferſon*, ſpeaking of the negroes, ſays, 'Comparing
'them by their faculties of memory, reaſon, and imagina-
'tion, it appears to me, that in memory they are equal to
'the whites, in reaſon much inferior, as I think one could
'ſcarcely be found capable of tracing and comprehending
'the inveſtigations of Euclid; and that in imagination they
'are dull, taſteleſs, and anomalous.' Indeed it may be reckoned unfair to compare the capacity of Africans with that of Europeans, who have been ſo long civilized; but it cannot be reckoned ſo in comparing them to the American Indians. Mr. *Jefferſon* continues—"Many millions of
'them have been brought to and born in America; moſt
'of them indeed have been confined to tillage, to their
'own homes, and their own ſociety; yet many of them
'have been ſo ſituated, that they might have availed them-
'ſelves of the converſation of their maſters; many have
'been brought up to the handicraft arts, and from that
'circumſtance have always been aſſociated with the whites.
'Some have been liberally educated, and all have lived in

'countries where the arts and ſciences are cultivated to a 'conſiderable degree, and have had ſamples of the beſt 'works from abroad. The Indians, with no advantages of 'this kind, will often carve figures on their pipes, not deſ-'titute of deſign and merit. They will crayon out an ani-'mal, a plant, or a country, ſo as to prove the exiſtence 'of a germ in their minds, which only wants cultivation. 'They aſtoniſh you with ſtrokes of the moſt ſublime ora-'tory, ſuch as prove their reaſon and ſentiment ſtrong, 'their imagination glowing and elevated; but never yet 'could I find, that a black had uttered a thought above the 'level of a plain narration, never ſee even an elementary 'trait of painting and ſculpture.'—*Notes on the State of Virginia*, page 232.

SPEECH and LANGUAGE.—Dr. *Thunberg* ſays, 'The 'language, which frequently is almoſt the only thing that 'diſtinguiſhes the indolent Hottentots from the brute crea-'tion, is poor, unlike any other in the world, is pronounced 'with a clack of the tongue, and is never written.' *Gamon* ſays, 'The ſound of their voice reſembles ſighing.' *Spitſ-bergh* ſays, 'that their language reſembles the clucking of a 'turkey.'

In whatever reſpect the African differs from the European, the particularity brings him nearer to the ape. The LIPS, however, form an exception to this rule; and would have

been a conſiderable infringement on the order of gradation, if the ape had been poſſeſſed of the faculty of ſpeech. But as it is, the chaſm betwixt the African and the ape, relative to ſpeech, is ſo great, that we need not wonder at a change in the organization. With reſpect to this point, it may be remarked, that ſince the mouth of the African protrudes more; ſince the diſtance is of courſe greater from the throat to the teeth, and all the appendages of the mouth, except the chin, are larger than in Europeans; it was perhaps neceſſary to have the lips larger, in order to ſtrengthen or modulate the voice in ſpeaking or ſinging. It is further obſervable, that ſuch Europeans as have concave mouths, or are denominated in-mouthed, have all thin lips; and in ſuch the diſtance from the wind-pipe to the teeth is of courſe leſs than in thoſe who are out-mouthed. Now it is found, that in wind inſtruments, both the length of the tube and the form of its extremity, have an effect upon the ſound: the longer the tube, the deeper will be the note; and the more divergent its extremity, the louder will be the ſound. Out-mouthed people ſeem then to require thick divergent lips, in order to give force and energy to their utterance. All the other parts ſubſervient to ſpeech, and thoſe ſubſervient to maſtication, being larger in the negro than in the European, the diſtance of the teeth from the larynx being alſo greater, the tongue larger, the teeth ſtronger, and the noſe broader, it ſhould ſeem that proportion required the

lips to be thicker, in order to give the beſt effect to the voice and articulation.

As an account of the manner in which the human voice and ſpeech is effected, is not to be met with everywhere, and as it bears a near relation to the preſent ſubject, it may not be improper to ſubjoin a few obſervations on that head.

The larynx is the organ by which the voice is formed; but without the aſſiſtance of the parts above it (as the throat, palate, uvula, mouth, teeth, tongue, noſe, lips, &c.) we ſhould not be able to form articulate ſounds, which are neceſſary for the communication of our ideas. When we have a mind to ſpeak, we draw in our breath, and, in expiring it, contract the vocal chords till they vibrate, and afford ſuch a ſound as we chooſe; this is modified by the tongue, lips, &c. ſo as to form determinate ſounds or words. The letters of the alphabet, which may be conſidered as elementary ſounds, are divided into different claſſes, denominated *gutturals*, *linguals*, *dentals*, *labials*, and *naſals*, according to the organ moſt particularly concerned in their pronunciation.—Thus, *a* and *o* are gutturals; *b* and *p*, labials; *c* and *s*, dentals; *l* and *r*, linguals; and *m* and *n*, naſals. Hence, as every letter and word requires a peculiar diſtinct action, diſpoſition, and configuration of theſe organs, which are viſible if nicely and accurately attended to, curious perſons have availed themſelves of this circumſtance to teach deaf and

dumb people to underſtand what is ſaid to them, and even to ſpeak intelligibly.

The manner in which the larynx acts is but little known, though various opinions have been given concerning it.—Some of the beſt modern phyſiologiſts are of opinion that the voice is formed by the air upon its egreſs, forcibly impinging on the ſides of the rimula, and exciting a tremulous motion, as in wind inſtruments. Others have imagined, with leſs probability, that it is produced after the manner of the ſound of muſical chords, bells, &c. where the percuſſion of ſome other body beſides air, excites the vibratory motion in the ſtrings, &c. which is communicated to the air. Others, again, have imagined the organs of ſpeech to comprehend the powers of both wind and ſtring inſtruments. All the notes of muſic reſult from the variety in the length, thickneſs, and tenſion of muſical chords. Thus, the ſhorter, ſmaller, and more tenſe any chord is, the more acute is the ſound, becauſe the vibrations are quicker; on the contrary, the longer, thicker, and laxer the ſtring, the ſlower is the vibration, and the graver the note. In the human voice, when an acute ſharp note is to be ſounded, the chords are ſtretched, made ſmaller, and more tenſe, by the *crico-thyroidaei* and *crico-arytenoidaei poſtici* muſcles, and the rimula is at the ſame time conſtringed. On the contrary, for a deep baſe note, the rimula is pretty open, and the chords are laxer and thicker, and the vibration ſlower, as then the rimula is in a great meaſure left to itſelf.

SENSE OF FEELING.—The cuticle, including *reticulum*, is much thicker and harder in black people than in white ones, the *reticulum* in the latter being a thin mucus, in the former a thick membrane. Wherever the cuticle is thicker, the *corpus reticulare* is thicker alſo, as appears by the feet of negroes. The office of the *rete mucoſum* is to keep the *papillae*, which are the immediate organs of touch, moiſt; and both together ſerve to defend them from injury: the thicker, therefore, thoſe integuments are, the duller muſt be the ſenſe of touch. It is no wonder then, that negroes have not that lively and delicate ſenſe of touch that the whites have, ſince both the cuticle and *rete mucoſum* are thicker in them.—In brutes this ſenſe is ſtill duller than in negroes.

PARTURITION.—There exiſt many differences in the human ſpecies, which have been attributed to relaxation, from heat; but which do not, in fact, proceed from that cauſe. We have had frequent accounts of the very eaſy parturitions of the natives of Africa, the Weſt Indies, America, and the ſouthern parts of Aſia, by *Brookes*, *Bruce*, *Wafer*, *Dampier*, *Neuhoff*, *Woods*, *Rogers*, *Pittavilliars*, and *Long*. Theſe writers inform us, that the women have very eaſy labours, and that they retire to the woods, bring forth alone, and return directly home,—after waſhing themſelves and their children in the ſea, or in a river. Such eaſy labours have been generally attributed to relaxation, from the warmth of the climate: but *Hen-*

Kæpius ſays, 'The wives of the Livonian peaſants and the 'ſavages of North America uſe the ſame cuſtom. The 'women retire to ſome private place when the time of 'their delivery is at hand, and return immediately after to 'their work.' As the ſame thing happens both in warm and cold climates, we cannot attribute it to relaxation from heat. It muſt, therefore, either be occaſioned by the infants of people of colour having ſmaller heads, or the mothers having large and capacious pelviſes, or from their living nearly in a ſtate of nature, or, perhaps, from all theſe three cauſes. Mr. *Soemering* ſays, the *pelvis* of the male negro is ſmaller than that of the European; but he does not ſay what is the ſize in the female. Several ſurgeons of Guinea-ſhips have informed me, that, in general, the negreſſes have larger hips and more capacious *pelvises* than European women; and, as the heads of adult negroes are ſmaller than thoſe of the Europeans, we may ſuppoſe that the heads of their infants are alſo ſmaller. Something, likewiſe, may be attributed to their living in a ſtate of nature; for it has been obſerved by Dr. *Bland**, 'that thoſe 'cows that are kept in London upon groſs and improper 'food, with little exerciſe, have more frequently difficult 'labours, and ſuffer more in conſequence of parturition than 'thoſe that live in the country, under leſs reſtraint, and in 'a manner more adapted to their nature.' But whatever

* Obſervations on Human and Comparative Parturition, page 40.

may be the cauſe or cauſes, the fact ſeems to be, that women of colour have eaſier parturitions, in general, than white Europeans; and that brutes have eaſier parturitions than the human ſpecies.

Diseases. Locked jaw.—This is a complaint with which various ſpecies of the animal kingdom are afflicted: it does not, however, equally prevail amongſt all thoſe ſpecies. It attacks the human European, ſometimes in their own climes; but more frequently, and more fatally, in the torrid zone. Medical obſervers ſtate, that negroes are much more liable to it, and that it is more fatal to them, even in the torrid zone, than to Europeans. It is ſtill more frequent among quadrupeds, and more fatal to ſome of them, particularly horſes, than to negroes. I have often ſeen this diſeaſe, both in the human ſpecies and in horſes; but where one of the human ſpecies ſuffers with it in this kingdom, I may ſafely ſay, that ten or twenty horſes are affected by it. I have known it ariſe from docking, and nicking their tails; from cropping, or ſetting their ears; alſo, after caſtration, and many other operations; from gathering a nail in the foot; and, frequently, when no viſible cauſe could be diſcovered.

Dr. *Benjamin Moſely*, in his treatiſe on Tropical Diſeaſes, ſays, 'I have loſt many patients in the locked jaw, after 'amputations; and never found that leaving out the nerves, 'or whether ligatures were made or not, cauſed the ſmalleſt

' difference in the event, nor were any ſecurity againſt the ' locked jaw, nor diminiſhed the ſymptomatic fever.

' How far the ſenſibility of the nerves, or the irritability ' of the muſcles, are concerned in the tetanus; or how the ' muſcles ſhould act in ſympathy without the nerves appear- ' ing to be any way affected, is, I believe, in as much ob- ' ſcurity as GALEN'S *principalis animæ vis.*

' The locked jaw appears to be a diſeaſe entirely of irri- ' tability. Negroes, who are moſt ſubject to it, whatever ' the cauſe may be, are void of ſenſibility to a ſurpriſing de- ' gree. They are not ſubject to nervous diſeaſes. They ' ſleep ſound in every diſeaſe, nor does any mental diſturb- ' ance ever keep them awake. They bear chirurgical ope- ' rations much better than white people; and what would be ' the cauſe of inſupportable pain to a white man, a negro ' would almoſt diſregard. I have amputated the legs of ' many negroes, who have held the upper part of the limb ' themſelves.—Suſceptibility of the tetanus, whether original ' or ſymptomatic, does not depend on age or ſex, neither ' is it confined to the human ſpecies:—every ſpecies of ' animal is ſubject to it: I have ſeen many horſes die of it. ' It ariſes in animals from many of the ſame cauſes that ' produce it in human beings.

' Negro children are chiefly the victims of this diſeaſe in ' the Weſt Indies. — The cauſe of the tetanus among chil-

'dren in the Weſt Indies is generally attributed either to the 'intemperance of the mother during pregnancy, or to the 'irritation of the navel after birth, or to the ſmoke* of the 'lying-in room, or to the dampneſs of its ſituation, or to 'the careleſly letting in cold air upon the child. Some 'people even attribute it to the wickedneſs of the mother, 'to avoid the trouble of bringing up the child. The ne-'groes often charge it to the malice of OBED, or witch-'craft. Speculators have ſearched for other cauſes in the 'moſt remote corners of nature. That negroes, who never 'ſee this accident happen to white children, nor any others 'who have proper care taken of them, if born healthy, 'ſhould attribute it to witchcraft, is very natural; but that 'phyſicians ſhould be ignorant of the cauſe, and that the 'effects ſhould ſo often be permitted to happen, is extraor-'dinary and unnatural.'

Dr. *John Hunter*, in his Obſervations on the Diſeaſes of the Army in Jamaica, page 305, ſays, 'The diſeaſes of the 'negroes fell ſeldom under my obſervation; what I have 'to ſay of them, therefore, will be very ſhort, and chiefly 'with a view of calling the attention of others to the ſub-'ject; for we are hitherto much in the dark reſpecting ſe-'veral diſorders, that are in a great meaſure confined to

* Dr. *Clark* is decidedly of opinion, that the *iriſmus naſcentium*, or jaw-fall of infants, is occaſioned by the ſmoke of wood fires in the negroes huts:—where no fires have been made, he has never known the diſorder to occur.

' the negroes in that part of the world. A better hiſtory ' of them would enlarge our knowledge of pathology, and ' teach us, I doubt not, many new and intereſting facts in ' the animal œconomy.'

European women, in hot countries, are very ſubject to floodings, and to the *fluor albus*. Negreſſes are almoſt exempt from both theſe complaints; but are very liable to obſtructions of the *menſes*. *Gonorrhea ſimplex* is a very common complaint among the negro men, when there is not the leaſt ſuſpicion of any venereal taint.

That the Indians of America are ſubject to fatal diſeaſes, which do not affect white people, we have a convincing proof in the 54th volume of the Philoſophical Tranſactions, p. 386*. It is there related, that in 1763, in the iſland of Nantucket, there were three hundred and fifty-eight Indians, when a ſickneſs broke out, which, in about ſix months, ſeized two hundred and fifty-eight of them; of whom only thirty-ſix recovered. Of the hundred that eſcaped, thirty-four were with the ſick, eight ſeparate, eighteen at ſea, and forty in Engliſh families. It was particularly remarkable, that although the Engliſh inhabitants were much more numerous,

* " An Account of an extraordinary Diſeaſe among the Indians of Nantucket " and Martha's Vineyard, in New England: in a Letter from *Andrew Oliver*, " Eſq. Secretary of His Majeſty's Province of Maſſachuſſet's Bay, to *Iſrael* " *Mauduit*, Eſq. F.R.S."

not *one* of them had the ſickneſs; but that ſome perſons, half Dutch and half Indian; and one, half negro and half Indian, had it, and recovered. The diſtemper, about the ſame time, broke out at Martha's Vineyard, and was attended with ſimilar circumſtances.

Dr. *John Hunter* ſays, 'The *Cacabay* is a negro name 'for a diſeaſe not known among Europeans or their deſ- 'cendants, as far as I could learn. It begins in whitiſh 'ſpots upon the ſkin, near the ends of the extremities.— 'Thoſe ſpots turn to ulcers, commonly upon the fingers and 'toes; there is much ſwelling and pain, and the joint af- 'flicted drops off without any mortification. The ſore af- 'terwards heals up, and remains well even for months, but 'returns again, affects the next joint, which, after a time, 'drops off; and the diſeaſe, attacking one joint after ano- 'ther, in the end reduces the miſerable ſufferer to a mere 'trunk. It continues often ſeveral years before it proves 'fatal.'——He likewiſe mentions dirt-eating as a diſorder peculiar to negroes, and which frequently proves fatal to them.——On the other hand, ſpeaking of the expedition againſt Fort St. *Juan*, he obſerves, that few or none of the ſoldiers ſurvived; they being taken off by fevers, from which the negroes, who accompanied them, were almoſt wholly exempt. From this circumſtance he takes occaſion to recommend, that a company of negroes ſhould be attached to each

regiment, to perform any hard labour that might be required in the heat of the day.

We have equally authentic accounts, of negroes being wholly, or in great part, exempt from ſome diſeaſes, which prove very fatal to white people. That accurate obſerver, Dr. *Lining*, ſpeaking of the yellow fever which prevailed in South Carolina, ſays, 'There is ſomething very ſingular in 'the conſtitution of the negroes, which renders them not 'liable to this fever; for, though many of them were as 'much expoſed as the nurſes to this infection, yet I never 'knew an inſtance of this fever amongſt them, though they 'are equally ſubject with the white people to the bilious 'fever*.'

Mr. *Matthew Carey*, however, in his ſhort account of the malignant fever at Philadelphia†, after relating the above, obſerves; — 'The ſame idea prevailed for a 'conſiderable time in Philadelphia, but it was erroneous. They did not eſcape the diſorder: however, the 'number of them that were ſeized with it was not great; 'but, as I am informed by an eminent doctor, it yielded 'to the power of medicine in them more eaſily than in the 'whites.'

* Eſſays and Obſervations, vol. 2, page 407.

† Page 78.

With reſpect to the yellow fever which prevailed in the Weſt Indies in former years, and particularly that which, during the laſt ſummer, took off many of our ſoldiers, ſailors, and officers, and likewiſe many of the white inhabitants, I have made diligent enquiry of ſeveral officers and other well-informed people, but do not find that any of the negroes caught the diſeaſe, though many of them attended the ſick, and were employed in burying the dead.

Theſe remarks upon diſeaſes ſeem to prove, that there are original differences in the conſtitutions of the white Europeans, the negroes, and the Indians.

Mr. *Long* takes notice of a fact, which ſeems to have eſcaped the obſervation of naturaliſts:—that the lice which infeſt the bodies of negroes are blacker, and generally larger, than thoſe which are found on white people*.

The African's MANNER OF WALKING is very different from that of the European's, and very much reſembles that

* Perhaps this apparently trivial circumſtance may be deemed no inconſiderable argument in ſupport of the opinion that Africans are a different race from Europeans. It is known to naturaliſts, that the different ſpecies of animals and plants nouriſh various inſects, many of which are ſupported upon one or a few ſpecies. Rarely, if ever, is it found that the ſame plant or animal, modified by any peculiarity in the ſoil, ſituation, &c. is refuſed by the inſect on that account: yet, I have been informed by negroes born in North America, who had never been in a hot climate, that their lice were of a black colour, and larger than thoſe common to Europeans; and that thoſe which infeſt the Europeans ſeem to refuſe the negroes.

of the ape. This, no doubt, proceeds from the bones of the leg and thigh being gibbous, from the flatneſs of the feet, from the height of the calves of the legs, and from the ſmallneſs of the gaſtrocnemii muſcles. Theſe circumſtances, together with the forward poſition of the head upon the ſpine, oblige them, when they walk, to put themſelves into ſuch an attitude as will beſt preſerve their balance.

We have now ſhewn that there exiſt material differences in the organization and conſtitution of various tribes of the human ſpecies; and not only ſo, but that thoſe differences, generally, mark a regular gradation, from the white European down through the human ſpecies to the brute creation. From which it appears, that in thoſe particulars wherein mankind excel brutes, the European excels the African.

It remains yet to notice, that in thoſe particular reſpects in which the brutes excel mankind, the African excels the European: theſe are chiefly the ſenſes of SEEING,—HEARING,—and SMELLING;—the faculty of MEMORY,—and the power of MASTICATION.

SEEING.—Profeſſor *Pallas* informs us, that 'Nothing 'is more aſtoniſhing than the acuteneſs of *ſight* in moſt of 'the Calmucks, and the extraordinary diſtance at which 'they perceive very minute objects, ſuch as the duſt raiſed 'by cattle or horſes, and this from places very little ele-'vated.'

Soemmering informs, us that 'the olfactory and optic 'nerves, and thoſe of the 5th pair, are uncommonly large 'in the African.' Neither Calmucks nor negroes, however, can be compared with hawks, eagles, and ſome other birds, in acuteneſs of viſion.

HEARING.—The *meatus auditorius* is wider in the Negro than in the European. The external ears of Negroes are, notwithſtanding, in general, ſmall and round, and have no lobes. This is the caſe with many monkeys: but the Calmucks have very large ears, which ſtand out conſiderably from the head; and the ears of Dr. *Tyſon*'s pigmy were conſtructed in the ſame manner. There ſeem, therefore, to be two different approaches to the brute ſpecies in the conſtruction of the external ear.—Profeſſor *Pallas* ſays, the Calmucks hear, at a great diſtance, the trampling of horſes, the noiſe of an enemy, of a flock of ſheep, or even of ſtrayed cattle: they have only to ſtretch themſelves on the ground, and to apply their ear cloſe to the turf.—Certain quadrupeds, as hares, horſes, aſſes, and ſuch others as can erect their large ears, are ſtill more perfect in hearing than the Calmucks.

SMELLING.—It is obſervable that negroes have wider noſtrils than Europeans. *Pallas* informs us, that the noſe of a Calmuck is of a ſtructure quite ſingular, being, generally, flat and broken towards the forehead. They find

the ſubtilty of the ſenſe of ſmell very uſeful in their military expeditions; for by it they perceive, at a diſtance, the ſmoke of a fire, or the ſmell of a camp. There are many of them who can tell, by applying the noſe to the hole of a fox, or of any other quadruped, whether the animal be in or not. But dogs poſſeſs this ſenſe in the greateſt perfection.

It is ſaid that negroes excel Europeans in MEMORY; but thoſe domeſtic animals with which we are beſt acquainted, as the horſe and the dog, excel the human ſpecies in this faculty.

Negroes have ſtronger powers of MASTICATION than Europeans: and moſt quadrupeds have them ſtill ſtronger.

As to the ſenſes in general, ſo far as relates to the human ſpecies, cuſtom and exerciſe ſeem to have a conſiderable effect in improving them; but are not, it may be preſumed, ſufficient to account for the differences that actually exiſt *.

* The reader will find a large extract from a treatiſe entitled "On the Corporeal Difference of the Negro and European," by *S. T. Soemmering*, M. D. Profeſſor of Anatomy at Mainz, &c. &c. 1785. 8vo. The original is printed in the German language: and Dr. *Holme*, Phyſician to the Mancheſter Infirmary, has done me the favour to tranſlate the extract into Engliſh. It contains ſome important obſervations of that celebrated anatomiſt, on the organs of the ſenſes, the bony ſyſtem, &c. in Negroes; and likewiſe on the brain and nerves.

It will not be amiſs here to exhibit, in one point of view, the concluſions deducible from the facts and obſervations ſtated in the ſecond part of this eſſay.

1. There are material differences in the corporeal organization of various claſſes of mankind.

2. Taking the European man as a ſtandard of compariſon, on the one hand, and the tribe of ſimiæ on the other; and, comparing the claſſes of mankind with the ſtandards, and with each other, they may be ſo arranged as to form a pretty regular gradation, in reſpect to the differences in the bodily ſtructure and economy, the European ſtanding at the head, as being fartheſt removed from the brute creation.

3. That the African, more eſpecially in thoſe particulars in which he differs from the European, approaches to the ape.

4. That the following characteriſtics which diſtinguiſh the African from the European, are the ſame, differing only in degree, which diſtinguiſh the ape from the European:

IN THE BONY SYSTEM,

The narrow and retreating forehead and hind-head.

The flat bone of the noſe.

The great diſtance betwixt the noſe and mouth.

The ſmall retreating chin.

The facial line.

The great diſtance betwixt the ear and the fore part of the mouth.

The ſmall diſtance between the *foramen magnum* and the back of the head.

The long and ſtrong under jaw.

The large bony ſockets which contain the eyes, and the wide *meatus auditorius*.

The long fore arm.

The flat foot; and the length, breadth, ſhape, and poſition of the *os calcis*.

IN OTHER PARTS OF THE SYSTEM,

The broad and flat cartilage of the noſe.

The ſmall *gaſtracnemii*, and large temporal muſcles.

The long *tendo achillis*.

The thick ſkin, and ſhort woolly hair.

The ſmall brain.

The long breaſts of the females.

The parts of generation.

The paucity of different diſcharges.

The rank ſmell.

Their manner of walking.

The power of adaptation to a warm climate.

Their ſhorter period of life.

5. That different claſſes of men are not liable to all the diſeaſes incident to mankind, and that they are infeſted with different inſects.

6. That, in comparing the claſſes of mankind with each other, and with the brute creation, as in the ſecond article, there is a gradation alſo diſcoverable in the ſenſes of *ſeeing*, *hearing*, and *ſmelling*, in *memory*, and in the powers of *maſtication*, but in a contrary order to that above ſtated, the European being leaſt perfect, the African more ſo, and the brutes moſt perfect of all, in theſe particulars.

PART THIRD.

ON HAIR.

HAIR is ſcattered over the whole ſurface of the human body, except on the inſide of the hands and the ſoles of the feet. In moſt parts it is ſoft and ſhort, and grows only out of the ſkin; but upon the head, eye-brows, eye-lids, arm-pits, and pubes, and upon the chin in man, alſo upon the tails and manes of ſome animals, it ariſes from a bulbous root, more or leſs oval, which is membranous, vaſcular and ſenſible, and ſeated in the cellular ſubſtance beneath the ſkin; and in theſe ſituations it grows long. The covering of the root, filled with a pulp, paſſes out in a cylindrical figure, through a pore or opening of the ſkin, to the cuticle, which is extended along with it, ſo as to form a capſula to the hair itſelf, which, by this means, is rendered permanent and incorruptible. Beyond the ſurface of the cuticle, the covering of the hair is not demonſtrable, though the ſpongy and cellular matter is continued through the whole length of the hair. Theſe hairs with bulbous roots grow continually, and are re-

newed again, after being cut; which is ſaid to be by a protruſion of their medullary ſubſtance, from the ſkin outwards, under a production of the cuticle. It is likewiſe ſaid, that when the hairs are deſtitute of this *medulla* (as in old people) they dry up, ſplit, and fall off, and become ſemi-tranſparent, or, as it is commonly called, white or grey. So far is certain, that in old people, or in premature old age, the hair is frequently deprived of its colouring matter, from ſome cauſe or other: and this likewiſe will happen from local premature old age; as ſome perſons firſt have the ſymptoms of old age in one part, others in another part. This will alſo happen from diſeaſe, from accidents, and in all climates. It generally takes place earlier in Negroes than in Europeans, which is moſt probably owing to the former being ſhorter lived than the latter. The branching of the hair is viſible enough at the extremity, with a microſcope; and it is ſaid to be apt to ſplit, if ſuffered to grow long, or if kept too dry*. It is certain, that, long after death, when all the other parts and humours are putrified and corrupted, the hair will vegetate and increaſe; which it appears to do, as long as any moiſture remains in the part.—The beard in man and in the goat, and the mane in the lion, diſtinguiſh the male from the female.

* I have ſome doubts of this fact; for, upon viewing ſome hair with a microſcope, it appeared to me to throw out ſide-ſhoots, like vegetables.

The hair does not ſeem to have engaged ſo much of the attention of naturaliſts as it deſerves. That which ſerves for a covering to the body of animals, and is properly called their *coat*, has uſually been confounded with that which ſerves for ornament on the head, and with that which ariſes, at puberty, on the chin and other places, in the human ſpecies. Hence it has been argued, that negroes have ſhorter hair than Europeans—becauſe that hair which conſtitutes the coat of animals, is ſhorter in hot climates than in cold ones. This argument, however, being founded on erroneous principles, is of no force. For, though the hair, in general, may not improperly be ſaid to be of a vegetable nature, yet there is an eſſential difference between the hairs which form the coat of an animal, and thoſe which grow upon the head, chin, &c. of the human ſpecies: not only do they take root differently, as has been obſerved already,—but another circumſtance is particularly deſerving of notice: The former is an *annual*—the latter, a *perennial*. The coat of animals, which ſeems deſigned by nature as a protection from cold, is much longer in cold climates than in warm ones. It grows faſter in winter than in ſummer; and before the cold ſeaſon is over, changes colour, even to whiteneſs, in very cold climates: at the expiration of the year, it dies away, falls off, and is ſucceeded by a freſh crop for the enſuing year.——On the other hand, that which grows on the head, chin, &c. of the human ſpecies, having a deeper root than the former, grows for a ſeries of years;

and, in European whites, it attains a greater length in *warm* climates than in *cold* ones. Agreeably with this remark, it will be found to grow both longer and thicker in Greece, Italy, and Turkey, than in France; in France, more ſo than in England; and in England, more ſo than in the more northern parts of Europe*. We alſo find that artificial warmth increaſes its growth. In France, where they are deſirous of having a great quantity of long hair, they ſleep with much covering on their heads, and uſe much powder and pomatum, which defend it from the cold: theſe means ſeldom fail of producing the deſired effect. Exceſs of heat is ſaid to be prejudicial to the growth of hair; but this does not appear to be the fact: for negroes, in the burning ſands of Africa, have hair as long, or longer, than the natives about the Cape of Good Hope, in the temperate zone,—whoſe hair, notwithſtanding they uſe much greaſe, is ſo ſhort and woolly, as to be compared to the nap upon cloth. — One author ſays, that the woolly hair of the negro, born in northern climates, will grow longer and leſs curled than in the torrid zone; but do we not daily ſee inſtances of negroes, born in North America, and in England, whoſe hair is as ſhort, curled and woolly, as it is in the native Africans? Barbers and hair-dreſſers obſerve, that the beard and hair of the head grow one-third more in ſummer than in winter.

* The hairs upon the breaſt and legs of Europeans, grow much longer and faſter under the torrid zone than in a temperate climate. Negroes, it is obſervable, have no hair upon their breaſts or legs.

—It ſeems that women, in general, have longer hair than men; particularly thoſe inclined to corpulency.

The natural curl of the hair cannot be owing to the warmth of the climate, as has been aſſerted by ſome authors; for, there are more among the Europeans who have curled hair, than among the natives of South America, whoſe hair indeed is uſually ſtraight and lank. Neither can it be owing to the ſtate of ſociety, nor to the want of civilization, that negroes have ſhort, curled, woolly hair*; for Europeans, in like ſituations, have it not. We do not find that the ancient Gauls and Britons had their hair materially different eighteen hundred years ago, from what it is at preſent. *Julius Cæſar* obſerves of the latter, that 'they 'wear the hair of their heads very long, but ſhave all the 'reſt of their bodies, except the upper-lip.' *Strabo* ſays, that the Gauls let their hair grow long; and that the hair of the Britons is not ſo yellow as that of the Gauls. Yet all hiſtorians agree in repreſenting theſe people nearly as rude in their manners, civil polity, and religion, as it is poſſible for any people to be at this day.

In ſome parts of Scotland and Ireland, the inhabitants live in rude and ſmoky huts, with hardly any of the com-

* Long ſays, "The Creole negroes dread rain upon their bare heads as much "as the native Africans: perhaps their woolly fleece would abſorb it in large "quantity, and give them cold." All animals that are covered with wool, ſeem to ſuffer more in rainy, wet ſeaſons, than thoſe animals that are covered with hair.

ſorts of civil life; nevertheleſs the hair of theſe people grows as long, and their beard as full, as in thoſe who are placed in the higheſt rank of civilization.

The inhabitants of the Malabar coaſt, in the Eaſt Indies, are as black as thoſe upon the African coaſt; but they have long hair. I have lately ſeen one, whoſe name is *John Lee*, a Laſcar, from Anjengo, ſituated in the torrid zone, in north lat. 7°, whoſe ſkin is as black as that of the generality of negroes; but his hair is long; his noſe not flat, nor broad; his lips not thick; and his mouth not projecting. I am informed by a gentleman who has been on the coaſt of Malabar, that ſome of the inhabitants are as black as jet.—This is, therefore, a ſtriking proof that the colour of the ſkin, the nature of the hair, and the form of the body, do not depend upon the ſame cauſe.

The long ornamental hair of the head, beard, &c. in the human ſpecies, exhibits a gradation in the ſame line as the other marks of diſtinction. The European has the longeſt hair; next to him the Aſiatic; then the American; and, laſtly, the African. Even the natives of Africa manifeſt various degrees* in this reſpect; nor does it appear that the ſhorteſt hairs and the deepeſt coloured ſkins always accompany each other. I have ſeen many negroes, of a jet black,

* See note 8.

whoſe hair might have been drawn out three or four inches long, and have formed a ſhort *queue*; and I have ſeen others, of a yellowiſh complexion, whoſe hair was no longer than the frize or nap upon cloth. Theſe laſt, in reſpect to their perſons and their intellects, appeared to me to be the loweſt in the ſcale of humanity, and much to reſemble the Hottentots deſcribed by Dr. *Thunberg*.

Dr. *Sparmann*, who ſpeaks more favourably of the Hottentots than moſt authors, ſays — 'The hair of the head is 'black and frizzled, though not very cloſe; and has ſo 'much the appearance of wool, that it would be taken for 'it, were it not for its harſhneſs. They have but ſeldom 'any appearance of beard, or hair upon other parts of their 'bodies, ſuch as are ſeen upon Europeans; and when any 'thing of this kind happens to be viſible, it is always very 'trifling, and generally of the ſame kind as that on the 'head.' — We have particular inſtances of the hair on the head growing in large quantities, and to a very great length in Europeans, eſpecially in the warmer climates. — An Italian lady was ſhewn at *Aſtley*'s Theatre in London, in the year 1792, whoſe hair was ſo long that it trailed on the ground when ſhe ſtood upright. — *Gemelli Careri* remarks, 'that the Greek women, eſpecially in the neighbourhood 'of Conſtantinople, have extremely fine hair; but that thoſe 'whoſe hair deſcends to their heels, are leſs regular in their 'features.' — Lady *Wortley Montague*, in her letters from

Turkey, ſpeaking of the Turkiſh women, makes frequent mention of the very great quantity and length of their fine hair, which reaches to their heels;—of their white ſkins,—black eyes,—and moſt beautiful complexions. Many of the Chineſe have long hair, hanging to the ground. There is at this time in London, from Canton in China, a man whoſe hair reaches to the ground when he ſtands upright, though he is a perſon of ſtature. Canton is in the torrid zone, in north lat. $\frac{23}{25}$ degrees.

Notwithſtanding the hair of the head, in general, grows longer in warm climates than in cold ones, there are inſtances of its growing to a great length in a temperate climate. In one inſtance, that of a Pruſſian ſoldier, the hair was ſo long as to trail upon the ground. I have myſelf ſeen an Engliſh woman, the wife of a theatrical gentleman, whoſe hair is ſix feet in length, and weighs upwards of three pounds, without that part which is nearly connected with the head: its colour is of a light brown.—The lady's ſtature is about five feet five inches, and ſhe is rather inclined to corpulency.

The fine, long, flowing hair appears to be given for ornament. The Univerſal Parent has beſtowed it upon but few animals, and thoſe of the nobleſt kind:—upon man, the chief of the creation—upon the majeſtic lion, the king of

the foreſt—and upon that moſt beautiful and uſeful domeſtic animal, the horſe.

It is preſumed, that from what has been already ſaid, it will be fully underſtood, how much the varieties in the growth of the hair of the head, depends on the climate. But as the wool of ſheep has a near affinity to hair, and as it has been ſaid by ſome to be materially altered by climate, it may be neceſſary to make this alſo a ſubject of our enquiry.

Buffon aſſerts, that our ſheep, when tranſplanted into warm countries, ſuch as Guinea, loſe their wool, and become covered with hair. The ſame circumſtance is related in the '*Report of the Directors of the Sierra Leona Company*,' lately publiſhed; and Dr. *Pallas* ſays, that extremes of heat and cold, alike tend to render the fleece coarſe and hairy:—And he quotes a fact, upon the authority of *Demanert*, that there are two kinds of ſheep in Guinea; one of which carries wool; and the other, a thin coat of hair only, reſembling goats hair.

The ſame ſeems to be the caſe in India *. Dr. *Wright*, however, who lived many years in Jamaica, ſpeaking † of the opinion that the wool of ſheep becomes more hairy in

* Vid. the Second Appendix to Dr. *Anderſon*'s "Account of the different Kinds of Sheep," &c. † Ibid. page 133.

warm climates, ſays, that in the Weſt India iſlands, it is true, there is to be found a breed of ſheep, the origin of which he has not been able to trace, that carry very thin fleeces of a coarſe ſhaggy kind of wool; which circumſtance, he thinks, may naturally have given riſe to the report. But he never obſerved a ſheep that had been brought from England that ever carried wool of the ſame ſort with thoſe native ſheep: on the contrary, though he has known them live there ſeveral years, theſe Engliſh ſheep carried the ſame kind of cloſe burly fleece that is common in England; and, in as far as he could obſerve, it was equally free from hairs.

In order to determine the true ſtate of the caſe, and to aſcertain the differences betwixt the hair of animals and the wool of ſheep, Dr. *Anderſon* has made a conſiderable number of experiments and obſervations.—After taking notice, that although the wool of ſheep and the hair of animals are alike annual productions, the Doctor obſerves, that they differ in the following particular—the former is ſhed all at once, and leaves the animal bare; whilſt the latter falls off more gradually, by which the old and new hairs become blended together. He then remarks an important difference between wool and hair: that the latter is generally of an uniform thickneſs, throughout its whole length; or, if there be any difference, it is, that it is ſmalleſt at the point;—whereas, the former is always variable, in the thickneſs of

its filament, throughout its whole length; and, in general, is conſiderably thicker towards the points than towards the roots—theſe facts clearly ſhewing that wool grows by having the part next the root protruded, and not by a prolongation of the extremity; and that the thickeſt part of the fibre grows in ſummer, and the ſmalleſt in winter. This latter concluſion was confirmed by a variety of experiments, all of which proved that the growing part of the fibre varies in thickneſs with the temperature of the ſeaſon; being thickeſt in ſummer, ſmaller in ſpring and autumn, and ſmalleſt of all in winter. From this it may, perhaps, be fairly inferred, that wool muſt be coarſer in a warm climate, and finer in a cold one, within certain degrees:---a fact by no means generally underſtood.

So far, then, is the opinion from being juſt, that the ſhort, curled, woolly hair of the negroes is owing to climate, that, if we allow an affinity between the growth of wool and that of hair, and aſſume that the varieties of the latter depend entirely on climate, we might expect to find the hair of negroes as long, and thicker, than that of Europeans. In dogs, we find, that climate has not much effect; for different kinds have retained their peculiar coats, for centuries paſt, in the ſame climate.

Perennial hair, annual hair, and wool, ſeem to be three diſtinct productions, eſſentially different from each other.---

Of the perennial hair, there are various ſpecies; as that upon the head of an European; that upon the chin, and on other parts of the body. The hair of the negro's head ſeems to be a different ſpecies from the European hair, and not a variety occaſioned by any difference of climate, or from any peculiar mode of living, dependent on their want of civilization.

PART FOURTH.

ON THE COLOUR OR COMPLEXION OF MAN.

THE great diverſity of complexion amongſt mankind, being a circumſtance ſo obvious and ſtriking, has generally been conſidered as the principal and moſt characteriſtic diſtinction of the varieties, as they are called, of the human race.

Various are the opinions which have been entertained by the ableſt naturaliſts, concerning the primitive cauſe of difference in the colour of man: it has uſually been attributed chiefly to climate: the extreme of heat, and likewiſe of cold, being ſuppoſed to produce the black colour. But, this being found inſufficient, ſome have added to it the ſtate of ſociety; comprehending under this head, the effects of diet, clothing, lodging, manners, habits, &c. all which, it has been argued with much ingenuity, are competent to produce the effect. Others have conjectured, with the late ingenious Dr. *Nicholls*, that diverſity of colour might be given

to man, and to various tribes of animals, by the provident Creator, as a ſafeguard from their enemies. The Doctor imagined that the blackneſs of the Ethiopian tended to confirm this opinion; for, as the extreme heat to which he is ſubjected confines him under cover all the day, this dark colour would conceal them from the numerous ravenous beaſts which infeſt thoſe parts, when he was to fetch in his neceſſaries and proviſions in the night-time.

The late Mr. *John Hunter*, I am informed, was of opinion, that the human ſpecies were originally black; becauſe many black animals will breed white ones accidentally, but no white ones breed black ones. He ſaid, the original breed of turkeys from the continent of Europe, and thoſe from the continent of America, though very different birds, were all black. Black rats and mice will, ſometimes, breed white ones; ſo will black crows, black-birds, and ſparrows. White African negroes have been born of black parents, and ſo have pye-balled, or blotched black and white children. Both of theſe have been brought to England, and ſhewn as curioſities. They had all the ſhape and appearance of ordinary negroes, except the colour; which was more of a dead white than the European. But no black children, he ſaid, were ever the produce of European parents.

Leaving it for thoſe who maintain that people of all colours deſcended from one common ſtock, to inveſtigate what may be the remote cauſe of difference in colour, we ſhall now attempt to ſhew, that an adequate cauſe has never yet been aſſigned. It is univerſally allowed, that the proximate cauſe is the colour of the *rete mucoſum*; that the *epidermis*, cuticle or ſcarf-ſkin, including the *rete mucoſum*, or *reticulum*, is thicker in the negro than in the European; and that in all the human race it is thinneſt in the face, and thickeſt where there is greateſt preſſure, as in the ſoles of the feet, &c.

Albinus, in his '*Diſſertatio ſecunda de ſede & cauſa coloris Æthiopum & ceterorum hominum*', informs us, that the reticulum is of a deeper colour on the under ſide, where it joins the true ſkin, than it is on the upper ſide, where it is joined to the ſcarf-ſkin. His words are, '*Reticuli color, ad quem redeo, ſaturatior eſt, qua id cuti proximum; ab altera parte, qua epidermi conjunctum, jam aliquantum extinctus. Itaque intelligi poteſt, qui fiat ut extrinſecus Æthiops tam fuſcus non ſit quam eſt pars intima reticuli ſui.*' And Mr. *Cruikſhank*, in a letter to Mr. *Clare* in his remarks on the ſkin and its pores, ſays, 'When a bliſter has been applied to the ſkin of a Negro, 'if it has not been very ſtimulating, in twelve hours after 'a thin tranſparent greyiſh membrane is raiſed, under 'which we find a fluid. This membrane is the cuticle or

'ſcarf-ſkin. When this, with the fluid, is removed, the 'ſurface which was under them appears black; but if the 'bliſter had been ſtimulating, another membrane in which 'this colour reſides, would alſo have been raiſed with the 'cuticle; this is the *rete mucoſum*, which is itſelf double, 'conſiſting of another very tranſparent membrane, and of 'a black web, very much reſembling the *nigrum pigmen-* 'tum of the eye. When this membrane is removed, the 'ſurface of the true ſkin (as has hitherto been believed) 'comes in view, and is white, like that of an European. 'The *rete mucoſum* gives the colour to the ſkin; is black 'in the Negro; white, brown, or yellowiſh, in the Euro-'pean.'

Mr. *Cruikſhank* has done me the favour to ſend me an elegant drawing of a preparation which he had made, to demonſtrate the outward integuments of a Negro, juſt as taken out of ſpirits.

That the upper layer of the *rete mucoſum* is lighter than the lower, muſt therefore be admitted; and this circumſtance may be adduced as a clear proof, that the colour is not owing to the heat of the ſun; ſince, if that were the caſe, the upper layer would certainly be of a deeper colour than the lower, being more expoſed to the action of the ſun's rays. Great ſtreſs, however, has been laid upon the circumſtance, that thoſe parts which are moſt expoſed to the ſun are black-

eſt, as the face; and that thoſe which are the leaſt expoſed are the paleſt; ſuch as the ſoles of the feet, palms of the hands, under the chin, the lower part of the belly, under the arms where they lie to the ſide, and between the fingers: but the real cauſe, which is preſſure, ſeems to have been overlooked. Wherever there is preſſure, the cuticle grows thicker and paler; and that in proportion to the degree of preſſure. The ſkin of the face is thinner and blacker, probably becauſe there is no preſſure upon it; ſo is the nipple and the areola, and the verge of the anus, in both ſexes. The *ſcrotum* likewiſe is blacker, which certainly cannot be owing to expoſure to the ſun.

I have been informed, by gentlemen of undoubted veracity, that in the Eaſt Indies there is a ſpecies of domeſtic fowls, the bones of which, when the *perioſteum* is ſtript off, are jet black. Whatever plauſibility may have been in the opinion, that the ſkin is rendered black by a hot climate, ſurely the *bones* cannot be affected in like manner.

It has been aſſerted, that negroes of a jet black are moſtly confined to the barren burning ſands of Africa, within the torrid zone. Dr. *Patterſon*, however, deſcribes the Caffres, a people inhabiting the country to the north-eaſt of the Cape of Good Hope, as far down as 31° of ſouth latitude, as being from five feet ten inches to ſix feet high, and of a jet black, having their eyes large, and their teeth as

white as ivory, &c. He deſcribes the country as being very fertile, and well watered; but adds, 'ſo far is the climate 'from being exceſſively hot, that the froſts are often found 'prejudicial to the corn.'

All thoſe naturaliſts who contend that the colour of the human ſpecies is cauſed by climate, advance, that there cannot be a more ſtriking inſtance of this than in the Jews. 'Theſe people' they ſay, 'are ſcattered over the face of 'the whole earth. They have preſerved themſelves diſ-'tinct from the reſt of the world by their religion; and as 'they never marry any but their own ſect, ſo they have 'no mixture of blood in their veins, that they ſhould dif-'fer from each other; yet nothing is more true than that 'the Engliſh Jew is white, the Portugueſe ſwarthy, the 'American olive, the Arabian copper, and the African 'black: in ſhort, that there appear to be as many differ-'ent ſpecies of Jews as there are countries in which they 'reſide.' Now granting them the fact as to colour, the premiſes are by no means juſt; for the Jews have gained proſelytes in every part of the world where they have reſided, and they are at liberty to marry thoſe proſelytes. But the truth is, that the Jews are generally ſwarthy in every climate *.

* 'In the ſuburbs of Cochin, a town in Malabar, there is a colony of induſtri-'ous Jews, of the ſame complexion they have in Europe. They pretend they

Analogous to the Jews, in this point of view, are the Gypſies: a numerous ſwarm of banditti ſpread over the face of the earth. They wander about Aſia, and the interior parts of Africa; and, like locuſts, have over-run moſt of the European nations. Conſtantly refuſing to participate of civilized ſociety, they keep themſelves ſecluded from the reſt of mankind. Their ſingular phyſiognomy and manners are the ſame in every age and country. Their ſwarthy complexion in the temperate climes of Europe, undergoes no change when expoſed to the burning ſun of Africa.

Spain is ſuppoſed to contain forty thouſand, or upwards, of theſe vagrants. They abound in Italy. They are ſcattered through Germany, Denmark, Sweden, and Ruſ-

'were eſtabliſhed there during the captivity of Babylon: it is certain they have 'been many ages in that country.'

Sketches of the Hiſtory of Man, vol. i. *p.* 29.

Dr. *Camper* ſays, 'there is no nation ſo diſtinguiſhable as the Jews. Men, 'women, and children, from their births bear the characteriſtic marks of their 'race. Mr. *Weſt*, the diſtinguiſhed painter, with whom I have frequently diſ-'courſed on the ſubject, confeſſing my inability to diſcover in what this national 'mark conſiſts, places it chiefly in the crooked form of the noſe. I acknowledge 'that this contributes much, and that it gives them a reſemblance to the Laſcars, 'of whom I have ſeen numbers in London, and have even taken the model of a 'face in Paris plaſter. But there is ſtill a ſomewhat unexplained.'

ſia. It is ſuppoſed Europe contains more than ſeven hundred thouſand of them*.

The diſcovery of America exhibited a people ſcattered over an immenſe continent which embraces both the torrid and temperate zones, of an uniform red copper-colour, and with long ſtraight hair, except near the northern extremity of the country, where they were of a very deep brown colour, inclining to black; and are ſuppoſed to have travelled thither, over land or ice, from the northern parts of Europe. No ſtronger proof than this ſeems required, that the colour of the ſkin is not the effect of climate. But it is ſaid that America is not ſo hot as Africa, and that therefore it does not produce negroes. Why then does it not produce white people, ſimilar in complexion to Europeans, ſince ſome part of it muſt correſpond to Europe in its mean temperature? Yet no white people were found there at firſt, nor have any of the red copper-coloured complexion been found on the other continent.

The Rev. Dr. *Sam. Stanhope Smith*, of Philadelphia, one of the lateſt and ableſt writers who attribute the colour of the human race to climate, &c. in his Eſſay on the Cauſes and Variety of Complexion in the Human Species, ſays, 'From

* A circumſtantial account of this vagrant race, has lately been written in German by *H. W. G. Grellman*, and tranſlated by Mr. *Raper*.

'the Baltic to the Mediterranean you trace the different 'latitudes by various ſhades of colour. From the ſame, or 'from nearly reſembling nations, are derived the fair Ger-'man, the dark Frenchman, the ſwarthy Spaniard and Si-'cilian,' &c. All thoſe national characteriſtics I deny. The children of the Frenchman, the Spaniard, and the Sicilian, are as far removed from the African, in colour, form, and in the nature of their hair, as are thoſe of the German or of the Engliſhman: the colour of adults is as good alſo, in thoſe parts that are covered with clothes: neither can the colour of their faces and hands be diſtinguiſhed from that of Engliſhmen, when they have reſided a winter or two in England, and gradually loſt the tan which they had received from the heat of the ſun in their native climate.

Dr. *Smith* further ſays, 'Another example of the power 'of climate, more immediately ſubject to our own view, 'may be ſhewn in the inhabitants of the United States. 'Sprung within a few years from the Britiſh, the German, 'and the Iriſh nations, who are the faireſt people in Eu-'rope, they are now ſpread over the continent from the '31° to the 45° of northern latitude. And notwith-'ſtanding the temperature of the climate, notwithſtanding 'the ſhortneſs of the period ſince their firſt eſtabliſhment in 'America, notwithſtanding the continual mixture of Eu-'ropeans with thoſe born in the country—notwithſtanding

'previous ideas of beauty, that prompted them to guard 'againſt the influence of the climate—and notwithſtand-'ing the high ſtate of civilization in which they took poſ-'ſeſſion of their new habitation, they have already ſuf-'fered a viſible change. A certain countenance of pale-'neſs and a ſoftneſs ſtrikes a traveller from Britain, the 'moment he arrives upon our ſhore. A degree of ſallow-'neſs is viſible to him, which through familiarity, or the 'want of a general ſtandard of compariſon, hardly at-'tracts our obſervation. This effect is more obvious in the 'middle, and ſtill more in the ſouthern, than in the 'northern ſtates,' &c. Taking all this for granted, can any other fair inference be drawn from it, than that the climate, for which nature never deſigned them, did not agree with them? and that they had loſt that appearance of ſtrong health and vigour which they had enjoyed in their native country? Certainly nothing is here advanced to prove the leaſt approach to the red Indian, the original native of America. It is not uncommon for a certain countenance of paleneſs and ſoftneſs to appear in any perſon, and in any climate, whether he be a white European or a black Afri-can, when he is much debilitated, or in a bad ſtate of health, however produced. In white Europeans, ſuch a ſtate is more eſpecially attended with a degree of ſallow-neſs if there be any obſtruction in the biliary ducts. Since theſe effects are more obſervable in the middle, and ſtill more in the ſouthern than in the northern ſtates, we have a

clear proof that the warm climates diſagreed with the ſettlers more than the temperate ones. The facts, therefore, do not ſupport Dr. *Smith*'s doctrine, but rather contradict it.

'The poor and labouring part of the community,' continues Dr. *Smith*, 'are uſually more ſwarthy and ſqualid in 'their complexion, more hard in their features, and more 'coarſe and ill formed in their limbs than perſons of bet- 'ter fortune and more liberal means of ſubſiſtence. They 'want the delicate tints of colour, the pleaſing regularity 'of feature, and the elegance and fine proportion of per- 'ſon.'

I doubt the validity of this remark: Are we not deceived by external appearances reſulting from dreſs, want of cleanlineſs, expoſure to the weather, neglect of perſon, and aukwardneſs in gait? It is ſurpriſing what difference takes place in a couple of months, when any poor fellows who anſwer the deſcription which the Doctor has here given, enliſt into his Majeſty's ſervice, and are made clean and neat; when, their hair being dreſſed and powdered, they are put under the care of a drill ſerjeant. What can exceed the forms of the perſons, or the colour of the ſkins, of our common ſoldiers, though taken from the loweſt claſs of people! Look at the regiment of *Blues*, many of whom were raiſed in the leaſt civilized parts of Lancaſhire; or

the *Greys*, a regiment compoſed of men in the loweſt order of ſociety in Scotland; or even examine many of the Iriſh regiments, filled by men who have been taken from the moſt wretched ſituations in which poverty could place men, and ſay whether the metropolis, the central point of civilization, or the richeſt and nobleſt families in the kingdom, can produce handſomer, or better complexioned men?

It has been advanced by ſome, that when the black inhabitants of Africa are tranſplanted to colder, or the white inhabitants of Europe to warmer climates, their children born there are of a different colour from themſelves; that is, lighter in the firſt, and darker in the ſecond inſtance.

This opinion I am very much inclined to queſtion, and muſt call upon its advocates to ſupport it by facts. They muſt prove what I am perſuaded will be found very difficult, or rather impoſſible; that the alteration from black to white, and the contrary, is general; and they muſt further prove, that the people in queſtion have never intermarried with any but thoſe of their own colour; and that their wives have been faithful: all this too for five or ſix generations; for in leſs time than this it is not even pretended that any material alteration is produced.

It will be much eaſier to prove the negative of this opinion. From innumerable inſtances, it is known that Euro-

peans have emigrated to the torrid zone, and that their deſcendants have reſided there for five or ſix generations, always preſerving the ſame ſhape and colour, and the ſame kind of hair, as other Europeans.

Mr. *Long*, in his Hiſtory of Jamaica, affirms, 'That the 'children born in England have not, in general, lovelier, 'or more tranſparent ſkins, than the offſpring of white pa- 'rents in Jamaica. In the ſouthern parts of the iſland they 'have none of that *vermicelli* ſo much admired in England; 'but, though expoſed, as lively children neceſſarily muſt 'be, very much to the influence of ſun-ſhine, their ſkins 'do not acquire the Engliſh tan, but in general grow pale, 'and a fainter white.'

At the time of the grand rebellion, one hundred and forty years ago, many families went from England to Jamaica; whoſe deſcendants are in the predicament above-mentioned.

It is certain that the deſcendants of negroes in North America, where no intermixture of European blood has taken place, retain their peculiar characteriſtics; the ſame form of body, the ſame black colour of the ſkin, and the ſame ſhort woolly hair as their originals: for this we need only appeal to any one who has had opportunity to ſee ſuch negroes. It ſeems, therefore, ſufficiently evident, that the

contrary opinion has originated under the influence of an hypotheſis.

Don *Carlos* de *Gimbernat* (the ſon of Don *Antonio Gimbernat*, firſt ſurgeon to the King of Spain) a young Spaniſh gentleman well verſed in natural hiſtory, who had lived much at the court of Madrid, aſſured me on good authority, that many Spaniſh families had reſided in South America for five or ſix generations, and, by never intermarrying with any of the natives, had retained their original colour, being as white as any Europeans. — This gentleman had reſided in Great Britain eighteen months, and was of as good a colour as any Engliſhman, though the Spaniards are generally reckoned ſwarthy; but this colour always wears off when they have reſided ſome time in a more northern climate, and was at firſt merely the effect of being tanned, or ſun-burnt; for their children are as white as other Europeans.

Mr. *de Maret*, who has lately publiſhed an excellent hiſtory of Africa, conjectures that the complete change from white to perfect black, might have taken place at the end of three centuries, or in fifteen generations, twenty years being allowed to each generation. But how is this poſſible, when a hundred and forty years reſidence in Pennſylvania has produced no ſenſible change? Suppoſing that a trifling change of colour is apparent in ſome individuals, who will

assure us, that they have no European blood in their veins?

It is said that the extreme of cold is productive of a tawny complexion, as well as heat; and that in consequence, the natives of the frigid zone are brown, and those who live farthest north almost entirely black. Hence it is imagined that the polar and equatorial regions are alike unfavourable to the human figure and complexion. The Laplanders, the Esquimaux Indians, the Samoied Tartars, the inhabitants of Nova Zembla, the Borandians, the Greenlanders, and the natives of Kamtschatka, partake more or less of this supposed effect of cold; but the Finlanders and Norwegians, who reside in climates of nearly the same severity, are fair beyond other Europeans, as has been observed by Lord *Kaimes**. He likewise says, 'The Moors 'in Hindostan retain their natural colour, though transplanted there more than three centuries ago. And the Mogul family continue white, like their ancestors the Tartars, though they have reigned in Hindostan above four centuries.—The southern Chinese are white, though in 'the neighbourhood of the torrid zone; and women of 'fashion in the island Otaheite, who cover themselves from 'the sun, have the European complexion.'

* Sketches, &c. vol. i. page 28.

The dark colour of the ſkin, in ſome particular parts of the body, is not confined to either the torrid or frigid zones: for in England the nipple, the *areola* round the nipple, the *pudenda*, and the verge of the *anus*, are of a dark brown, and ſometimes as black as in the Samoied women. It is to be remarked, that the colour of theſe parts grows darker in women at the full period of geſtation.

One morning I examined the breaſts of twenty women in the lying-in hoſpital in Mancheſter, and found that nineteen of them had dark coloured nipples; ſome of them might be ſaid to be black, and the *areola* round the nipple, from one inch to two inches and a half in diameter, was of the ſame colour. They were all either in the laſt month of pregnancy, or not diſcharged from their confinement.

That colour is not occaſioned by habits of living, or by the ſtate of ſociety, we need no better proof than that the Gauls and the Britons were in as ſavage a ſtate, when invaded by the Romans, as the nations of Africa and America are now; and yet they were of the ſame colour as their deſcendants at this day.

If the black colour of the ſkin were the effect of a warm climate, we might expect to find in other animals inha-

biting the torrid zone, and even in the vegetable creation, ſome traces of its influence; for

'The univerſal cauſe
'Acts not by partial, but by general laws.'

Nothing, however, is more certain, than that the various tribes of quadrupeds, birds, inſects, and reptiles in the torrid zone, manifeſt as great a variety of colour as in any other part of the earth; and that in the temperate zones we find at leaſt an equal proportion of black animals. As to vegetables, nothing can exceed the richneſs and brilliancy of colour they diſplay everywhere in the tropical regions.

We are informed that the children of negroes, when firſt born, are of the ſame ruddy colour as European children; but that the *ſcrotum* and the *glans penis* are black; and that they have a black or brown thread or circle on the extremity of the nails. The reaſon why all children, both of blacks and whites, and of every intermediate ſhade, are all born of a ruddy colour, is owing to the cuticle and *rete mucoſum* being ſo exceedingly thin and tranſparent: the latter not having yet acquired any colour, ſhews through it the colour of the *cutis vera*, or true ſkin, which is an integument very full of blood veſſels, and therefore nearly of the colour of blood itſelf. The cuticle and *rete mucoſum* grow gradually thicker and leſs tranſparent; and

in negroes the latter grows gradually darker coloured and harder; but the former preſerves its tranſparency in the face through life; which is evinced, in white people, by the redneſs of the cheeks, and by bluſhing; and in negroes by the ſuperior blackneſs of the face, the dark *rete mucoſum* appearing more clearly through it there than in any other part.

I had an opportunity of ſeeing a mulatto infant laſt winter, the offſpring of a white woman by a negro. The mother was a home-patient of the lying-in hoſpital, and her houſe was the reſidence of darkneſs and poverty. The ſkin of the child, on the day of its birth, had that ruddy appearance already mentioned; but notwithſtanding the circumſtances of cold and darkneſs, it ſoon began to alter, and approach to the mulatto colour.

We ſhall here ſubjoin a table of the mixtures of black and white people; ſhewing the different degrees of colour, which it is ſaid are ſufficiently recogniſable, and the names that have been appropriated to each.

Offspring of a	*Is denominated*	*Degree of Mixture.*
White and Black	A Mulatto	$\frac{1}{2}$ White and $\frac{1}{2}$ Black.
White and Mulatto	A Quadroon or Quarteron	$\frac{3}{4}$ White and $\frac{1}{4}$ Black.
Black and Mulatto	A Samboe or Quarteron	$\frac{3}{4}$ Black and $\frac{1}{4}$ White.
White and Quadroon	A Meſtize or Quinteron	$\frac{7}{8}$ White and $\frac{1}{8}$ Black.
Black and Samboe	A Quinteron	$\frac{7}{8}$ Black and $\frac{1}{8}$ White.
White and Meſtize	A (reputed) White *	$\frac{15}{16}$ White and $\frac{1}{16}$ Black.
Black and Quinteron	A (reputed) Black	$\frac{15}{16}$ Black and $\frac{1}{16}$ White.

Theſe diſtinctions are made in the Weſt Indies, and on the continent of America. Dr. *Thunberg* obſerves that ſimilar changes take place at the Cape of Good Hope; the offspring of a white and meſtize being quite white. In the ſucceeding generations their offspring continues quite white, or quite black, provided the marriages have been in that line; but without this intermixture of blood, it has never been aſcertained that blacks have a tendency to become white, or whites to become black, in any part of the earth.

Many accidents may indeed happen, by which the colour of the ſkin may be altered in a man or in brutes, as

* Theſe are white by law, and conſequently free in our Weſt India iſlands. They are not diſtinguiſhable from pure whites in complexion, features, or hair.—There is at this time a gentleman well known in the firſt circles in London, who was born in Jamaica, and deſcended from a white and meſtize; but he is not to be diſtinguiſhed from an European by any particular. I have ſeen ſeveral of this deſcription myſelf.

by inflammation, ulceration, or by wounds. If a negro, reſident in Guinea, is wounded, and the wound heal, the ſkin will ſometimes be white for a ſhort time, or even for life: in this caſe, it is eaſy to imagine the *rete mucoſum* may be deſtroyed, ſo as not to admit of a regeneration. The ſkin of an European may, in like circumſtances, become black, and continue ſo in perpetuity, eſpecially after a wound or ulcer of the leg. This I have frequently ſeen, both when the cure has been performed in a hot and in a cold climate.—Horſes, whoſe backs have been injured by the ſaddle, have frequently white ſpots upon them—and artificial ſtars are often made on their foreheads. In both theſe caſes, I imagine the *rete mucoſum* is deſtroyed, ſo as not to be regenerated; or that the veſſels are ſo altered, as to refuſe admittance to the colouring matter.

That diſcolouration of the ſkin, called tanning, or being ſun-burnt, and thoſe ſpots called freckles, are moſt incident to the faireſt ſkins, and ſoon wear off, if the parts be covered or kept from the ſun: theſe affections, no doubt, belong to the ſcarf ſkin only, or they would not ſo ſoon diſappear. Marks with gunpowder go no deeper than the ſcarf ſkin; for, if that come off, they are no longer ſeen, as I have frequently obſerved.

EXTRAORDINARY INSTANCES OF COLOUR.

Notwithſtanding it muſt be from general, rather than particular and accidental caſes of colour in the human ſkin, that the queſtion concerning its origin muſt be decided; yet, as irregularities may tend to illuſtrate the ſubject, the peculiarities of the *Albinos* become, in this place, proper ſubjects of inveſtigation.

I. ALBINOS.

Albinos conſtitute a variety of the human race, and are variouſly denominated in different parts of the globe.—Theſe people are to be met with in Aſia, in Africa, in America, and even in Europe; and are denominated *Albinos*, or white people, from their being totally deſtitute of that uſual colouring matter which ſhews itſelf in the ſkin of negroes, &c. and in the hair, the *uvea*, and *iris* of other people. Monſ. *Buzzi* thinks they want the *uvea* both behind the *iris* and under the *retina*, and the *rete mucoſum* in every part of the body. They cannot ſee ſo well as other people in ſun-ſhine, or ſplendid light, by reaſon, as is ſuppoſed, that the abſence of the *uvea*, or of the black *mucus*, admits light too copiouſly into the eye. The co-

lour of their complexion, too, is not the ſame as that which is natural to Europeans, but is a dead or milk white.—Their perſon, features, and hair are ſimilar to thoſe of their parents, the difference exiſting only in their colour; and their offspring never fails to return to the original colour of the natives of the place.—Similar varieties happen to many other ſpecies of animals; as rats, mice, moles, horſes, &c. which are ſometimes alſo deſtitute of the uſual colouring matter in the ſkin, hair, and eyes.

M. *de Sauſſure*, in his "*Voyages dans les Alpes*," gives us a deſcription of two *Albinos*, or white boys, at Chamouni.—According to his account, their eyes are not blue, but the *iris* of a very diſtinct roſe-colour; the *pupil*, too, when viewed in the light, is decidedly red, which ſeems to ſhew that the interior membranes are deprived of the *uvea*, and of the black *mucus* that ſhould line them. Their hair, their eye-brows, eye-laſhes, and the down upon their ſkin, were all, in their infancy, of the moſt perfect milk colour, and very fine; but their hair is now of a reddiſh caſt, and has grown pretty ſtrong. Their ſight, too, is ſomewhat ſtrengthened, though they exaggerate to ſtrangers their averſion to the light, and half ſhut their eye-lids to give themſelves a more extraordinary appearance.—He ſeemed to think that the redneſs of the *iris*, and their intolerance of light, argued a ſuffuſion of blood and organic debility. But M. *Blumenbach*, a learned phyſiologiſt, who had maturely

conſidered their caſe, attributes it to a different cauſe. He thinks it is occaſioned by the want of that brown or blackiſh *mucus* that, about the fifth week after conception, covers all the interior parts of the eye in its ſound ſtate.

2. PYEBALD, BLOTCHED, OR PARTY-COLOURED, BLACK-AND-WHITE PEOPLE.

Frequent inſtances of pyebald people occur. Some children are born ſo, and others become ſo afterwards. The parents of ſuch offspring are always, one or both of them, black, as no inſtance of European white parents having ſuch offspring has been known. It is remarkable, that the blotches are diſtinctly defined, the colours not running gradually one into the other. The ſame thing is obſervable in pyebald horſes, cows, pigs, and dogs; which are very common, at leaſt in Europe.

3. OTHER IRREGULARITIES OF COLOUR.

In the 55th volume of the Philoſophical Tranſactions, page 45, *James Parſons*, M.D. and F.R.S. relates two ſingular irregularities of the colour of children. The firſt is, that ſeveral years ago, a black man married a white woman in York, who, in due courſe of time, had a child that was entirely black, and very much like the father, both

in colour and features, without the leaſt participation of the features or colour of the mother. The ſecond is, that a black man married a white woman in London, who afterwards had a daughter, as fair as any one born of white parents, and like the mother in features; but her right buttock and thigh were as black as the father.

In the *Encyclopædia Britannica*, under the article *Negro*, we find an account of a young negro woman in Virginia, wife to a negro man, who had for the firſt time a black child, and the ſecond time twins—a boy that was black, and a girl that was a mulatto. The boy as he grew up was a perfect negro: the girl, on the other hand, was tolerably white; had blue eyes, and long black hair, without curl. In ſhort, ſhe had a great reſemblance to the overſeer of the plantation. Becoming pregnant the third time, ſhe was delivered of three children, two of them mulattoes, and the other a perfect negro. Reſpecting this account, I would obſerve, that ſince phyſiologiſts do not allow of a ſuperfetation, except in caſes where there are two *uteri* and two *vaginæ*, which there was no reaſon to ſuſpect in the preſent inſtance, we are obliged to conſider the overſeer, or ſome other white man, and not the black, as the father in the two laſt births. In addition to theſe, I muſt notice a caſe related to me by my worthy young friend Mr. *John Bayley*, of Hope.——As he was travelling from London to Windſor, in a ſtage-coach, he had for a fellow-traveller, a negreſs, with her two children that were twins,

a month old: the one was perfectly black, with ſhort, woolly, curled hair; the other was white, with long hair. She informed him that the father was an Engliſhman.

The following very ſingular particulars are taken from the Zoological Magazine, No. 12, page 369; but I dare not vouch for their authenticity.—1. In 1759, a girl was born in Somerſetſhire, with the hair on her head of two remarkably diſtinct colours. After ſhe was grown up a little, the hair on the right ſide appeared of a jet black, reſembling the father's; whilſt that on the left ſide was of a carroty red, reſembling the mother's; each occupying one half of the head, from a vertical ſection of the front.—2. It is ſaid, that a few years ago a perſon kept a public houſe in Tooley-ſtreet, Southwark, the whole right ſide of whoſe body was white, and the left ſide black. His father was white, and his mother black.—3. A Mr. John Clark, of Preſcot-ſtreet, Goodman's Fields, is ſaid to have had half of his body white, from the navel upwards, and the other half black. His father was a native of Africa, and his mother an Engliſhwoman.

Taking into conſideration the circumſtances reſpecting the Albinos, the pyebald, and other anomalous productions, we find nothing that points out climate or the ſtate of ſociety, as any way concerned in effecting thoſe modifications in colour.

Upon the whole, therefore, when we ſurvey the various claſſes of mankind, ſcattered over the ſurface of the globe, the white European, the copper-coloured American, the black African, and people of various other leſs diſtinguiſhed ſhades; and when we conſider the ſeveral facts and obſervations above adduced, which the experience of two centuries has afforded, it muſt be evident, the opinion that all people deſcended from one pair at firſt cannot be maintained, unleſs we find ſome other cauſes of the diverſity of colour beſides thoſe which have been uſually aſſigned for it.

CONCLUSORY OBSERVATIONS.

WHERE, for the illuſtration of any ſubject, a variety of facts are collected from every part of the globe, many of them muſt of courſe depend upon the relation of perſons whoſe impartiality or whoſe accuracy of obſervation may in ſome inſtances be queſtioned.——Enough, however, it is hoped, is aſcertained to diſprove the theories by which naturaliſts have attempted to account for what they denominate *varieties* of the human ſpecies; and to eſtabliſh that of a *gradation*, as well of the human race, as of the animal and vegetable kingdoms in general.

A gradation in the human race, ſuppoſing all to have deſcended from one pair, could only be the temporary reſult of accidental cauſes, and would ſcarcely merit a minute inveſtigation. But as a contemplation of the facts produced, leads to the concluſion, that various ſpecies of men were originally created and ſeparated, by marks ſufficiently diſcriminative, it becomes an important object, in general phyſiology, to trace the lines of diſtinction. Previouſly to diſcuſſing the queſtion of *ſpecies*, it ſeems neceſſary to conſider the ſignification of the term as uſed by naturaliſts.

It has been found convenient for the purpoſes of ſcience, to divide the three kingdoms into *claſſes*, *orders*, *genera*, and *ſpecies*, each ſuperior denomination comprehending one or more of the inferior. With reſpect to the three firſt diviſions, Nature herſelf does not ſeem to define, or even to recognize them, but leaves it for the ſagacity of the naturaliſt to ſeize the leading characteriſtics, and to arrange her productions accordingly. Of the laſt, however, there muſt be ſome determinate and invariable number, otherwiſe the productions of Nature would be liable to change every generation; and the ſpecies of animals, vegetables, and minerals, at this day, might be expected to be very different from what they were one or two thouſand years ago. We find the fact to be, that where Nature is left to herſelf, and not interrupted by the artifice of man, as in wild animals, all kinds maintain their reſpective *ſpecific* diſtinctions, through a ſeries of generations; and that anomalous productions are rarely met with. This leaves us to infer, as moſt naturaliſts have done, that ſpecies were originally ſo created and conſtituted, as to be kept apart from each other, with certain characteriſtic diſtinctions, which form a proper ſubject for inveſtigation. Theſe diſtinctions, notwithſtanding, have not, as it ſhould ſeem, been aſcertained in all caſes,—a diverſity of opinion reſpecting them ſtill prevailing, as may be ſeen by the quotations employed in the firſt part.

The moſt generally received characteriſtic of ſpecies is derived from generation. When animals, however unlike, can breed together, and their offspring is prolific, it has been deemed ſufficient to warrant the concluſion that they are of the ſame ſpecies, the diverſity of the parent animals being attributed to accidental circumſtances. On this principle, not only the various kinds of dogs, but even foxes, wolves, and jackalls, muſt be conſidered as of one ſpecies. It is allowed, however, that ſome animals, of different ſpecies, will breed together, as the horſe and aſs; but the circumſtance of their offspring being barren, effectually precludes the poſſibility of their being of the ſame ſpecies. Some proofs have indeed been adduced, and upon good authority, of mules generating, although it muſt be acknowledged that ſuch inſtances are extremely rare.

This hypothetic characteriſtic of ſpecies, derived from generation, will, I am afraid, not be found to agree with facts well aſcertained.—It is known to every one, notwithſtanding individuals of the ſame ſpecies are all diſcriminated one from another, yet that like animals generally produce their like, within certain degrees: even when the parent animals differ much from each other, the offspring, under the influence of this law, is of an intermediate nature, partaking of the properties of both. This being admitted, it is next to impoſſible to conceive in what manner the ſpecies of dogs, for inſtance, could have branched out into that diverſity of

kinds above alluded to, ſuppoſing that they are deſcended from one pair. But, even waving the enquiry how they came to be ſo diverſified, taking them as they really are at this moment, and allowing them a free intercourſe, they ought all to be reduced, in a few generations, to one common mould, reſulting from a mixture of all the varieties now ſubſiſting. This certainly ought to follow, on the ſuppoſition that they are all of one ſpecies, and equally prolific.

It may be ſaid, the ſuppoſition of a free intercourſe is not admiſſible, becauſe the varieties once ſubſiſting are carefully preſerved by attention in the breeding. This is perhaps in ſome degree true; but ſtill an enquiry will be ſuggeſted,—why does not Nature, though under theſe reſtrictions, occaſionally produce thoſe varieties which ſhe is ſuppoſed to have been the author of at ſome former period? Why does not the grey-hound occaſionally produce a maſtiff, the ſpaniel a bull-dog, and the lap-dog a wolf? Theſe are difficulties which the advocates for the hypotheſis ought, if poſſible, to obviate; ſince, whilſt they exiſt, they ſeem to render it altogether untenable.

I ſhould rather ſuppoſe that the different kinds of dogs, which, from time immemorial, have preſerved their diſtinctive qualities, are in reality ſeparate ſpecies of animals; and that all others are only varieties, or mongrels, produced by the intermixture of thoſe ſpecies, and which, like the mule, in

one, two, or more generations, in the mongrel line, loſe their prolific quality, and conſequently become extinct.—Neither the truth nor falſehood of this opinion can, I apprehend, be proved abſolutely from any facts known at preſent; but thus much muſt be admitted, that the preſent and former ſtates of the dog kind, are perfectly in agreement with the hypotheſis juſt advanced. Moſt certainly, the ſtate of this domeſtic animal, at preſent, in regard to kinds and varieties, compared with what it was at any former period, does not lead us to conclude that the varieties are upon the point of ſwallowing up the different kinds, which are as numerous and excellent as in any former period:—yet this concluſion is always preſented to us by the other theory.

To apply this to the human race.——Mr. *Long*, in his Hiſtory of Jamaica, affirms that he never knew two mulattoes have any offspring; and he ſeems ſuſpicious, that in the few inſtances where a mulatto-woman, married to a mulatto-man, may have had offspring, it is very probably derived from another quarter. I ſhould, however, ſuppoſe, that numerous inſtances might be found where two mulattoes have had offspring; yet, certainly, the fact related by Mr. *Long* is ſufficient to warrant the conjecture, that mulattoes, confined to themſelves, are not ſo prolific as others. The ſmall proportionate number of mulattoes in the Weſt Indies and in America, compared with what they ſhould have been

if equally prolific with other people, is a ſtriking circumſtance.

If this doctrine be admitted, it will be aſked, How are we to diſtinguiſh ſpecies from varieties? In anſwer to this, it may be obſerved, that varieties are reducible to the common ſtock again. Thus, amongſt men, *Albinos* are varieties, which do not fail in ſucceeding generations to return to the common ſtock. In vegetables, the variegated holly, for inſtance, will return to the common green holly, when propagated by ſeed, and can only be preſerved as a variety by grafting.—With reſpect to family, provincial, or national varieties of feature and complexion, it may be obſerved, that the more confined and circumſcribed the intercourſe of any people may be, the more they will aſſume and retain a ſameneſs of appearance; by reaſon that every anomaly of feature is worn out, through continual intermixture with thoſe more nearly reſembling the ſtandard. The people of every country, therefore, which has been long inhabited, and from which foreigners have been in a great meaſure excluded, will have the characteriſtics of its firſt ſettlers, who, if few in number, might entail a peculiar caſt of features on their poſterity. In England, where the intercourſe with foreigners has been great, and conſequently a great variety of features is found, we could ſelect individuals who would entail, if circumſtanced as above, the Scotch, the Iriſh, or

other European national characteriſtics, on their poſterity;—whereas, were we to range over Europe, we ſhould not find men likely to propagate a race of negroes or copper-coloured Americans.

From the numerous facts which have been adduced, it muſt appear evident, that various differences exiſt in the human race; ſome of which are generally known,—but others, it is preſumed, have never been before pointed out. In the bony ſyſtem, it has been ſhewn that the head, the arms, and the feet, differ materially; characteriſtic differences have alſo been pointed out in the hair, the colour of the ſkin, the complexion, the being adapted to a particular climate, and the being ſubject to different diſeaſes in the ſame ſituation.

There are but two ways of accounting for this great diverſity in the human frame and conſtitution. 1. To ſuppoſe that the diverſity, great as it is, might be produced from one pair, by the ſlow operation of natural cauſes. 2. Or to ſuppoſe that different ſpecies were originally created with thoſe diſtinctive marks which they ſtill retain.

The advocates for the firſt opinion, have endeavoured to account for the colour of man from the effects of the climate in which he reſides. Indeed, if climate can account for any particular diverſity, it muſt be that of colour; for

it is difficult to conceive in what manner it can affect the other differences, one way or another. Some have endeavoured to maintain, that in the courſe of about two centuries, during which white people from Europe have reſided in the torrid zone, and negroes from Africa in the temperate zone, there is a ſmall but viſible change in colour, the whites approaching a little towards black, and the blacks towards white; but they have by no means made out the fact in either caſe. Indeed, as has been already obſerved, the fact ſeems to be, that no general and permanent affection of colour is produced by climate. The temporary diſcolouration of the ſkin, called tanning, ſeems to have no relation to the permanent colour of the ſkin: it arrives at its *maximum* a very ſhort time after it begins, and is as ſoon worn off again; whereas the permanent black colour (ſuppoſing, for argument ſake, it could be effected in time) muſt require many centuries to effect it. Thus the father, it is ſuppoſed, tranſmits his degree of colour to the ſon, and the climate ſtill keeps increaſing it; and hence ultimately, from the climate alone, or at leaſt from external circumſtances, we are taught to expect the complete change from black to white, or the contrary, in the courſe of perhaps fifty or a hundred generations.

As to the opinion, that the conſtitution of man may be adapted to any climate by long reſidence, it is not only unwarranted by facts, but is in direct oppoſition to all ana-

logy, drawn from the animal and vegetable kingdoms at large.

On the other hypotheſis we can eaſily account for theſe and other diverſities in the human race; or rather indeed the hypotheſis itſelf preſumes upon ſuch diverſities. Beſides, we find that, in thoſe animals which moſt nearly reſemble man in their bodily conformation, there are a great number of ſpecies differing but in ſmall degrees one from another. The ſame obſervation, indeed, may be extended to the animal kingdom in general. Why then ſhould we ſeek to infringe this apparent law of nature in regard to man, unleſs to ſerve an hypotheſis?

The opinion here maintained, ſo far from degrading, tends much more to dignify the human race than the oppoſite one. For if, according to the latter, we admit that ſuch great varieties can be produced in the ſame ſpecies as we find to exiſt in man, it would be eaſy to maintain the probability that ſeveral ſpecies of *ſimiæ* are but varieties of the ſpecies Man; ſince they differ as little in their organization from ſome individuals of the ſpecies, as theſe do from men in general. And if the argument be ſtill further extended, almoſt all the animal kingdom might be deduced from one pair, and be conſidered as one family; than which a more degrading notion certainly cannot be entertained. But the opinion advanced above, effectually precludes any ſuch conſequences, as it places each

ſpecies upon its own proper baſis, and debars them from intermixing with other ſpecies, unleſs nearly reſembling themſelves, and even that in a limited manner.

Different ſpecies of men being once admitted, it will become a proper object of phyſiological enquiry to determine their number and diſtinction, with the merits, excellencies, and defects of each. In purſuing this enquiry there is no doubt but gradation will afford the proper clue to direct us. What the number of ſpecies may be, is not perhaps eaſy to determine. The four quarters of the globe will each, probably, furniſh us with at leaſt one. In Africa, however, there ſeems to be more than one ſpecies: and perhaps the loweſt degree of the human race reſides there. I am inclined to think that hair, rather than colour, ought to guide us in that quarter; and that it is not the blackeſt inhabitants, but thoſe with extremely ſhort hair, and a moſt ungracious appearance, as the Hottentots, who may be reckoned the loweſt on the ſcale of humanity. The Negro, the American, ſome of the Aſiatic tribes, and the European, ſeem evidently to be different ſpecies.

Aſcending the line of gradation, we come at laſt to the white European; who being moſt removed from the brute creation, may, on that account, be conſidered as the moſt beautiful of the human race. No one will doubt his ſuperiority in intellectual powers; and I believe it will be found that his capa-

city is naturally ſuperior alſo to that of every other man. Where ſhall we find, unleſs in the European, that nobly arched head, containing ſuch a quantity of brain, and ſupported by a hollow conical pillar, entering its centre? Where the perpendicular face, the prominent noſe, and round projecting chin? Where that variety of features, and fulneſs of expreſſion; thoſe long, flowing, graceful ringlets; that majeſtic beard, thoſe roſy cheeks and coral lips? Where that erect poſture of the body and noble gait? In what other quarter of the globe ſhall we find the bluſh that overſpreads the ſoft features of the beautiful women of Europe, that emblem of modeſty, of delicate feelings, and of ſenſe? Where that nice expreſſion of the amiable and ſofter paſſions in the countenance; and that general elegance of features and complexion? Where, except on the boſom of the European woman, two ſuch plump and ſnowy white hemiſpheres, tipt with vermillion?

BEFORE we conclude, it may be proper to attend a little to thoſe who may object to the doctrine herein contained upon other than philoſophical principles.

Some may reprobate it, under the apprehenſion that it has a direct tendency to diſcredit Revelation.—To theſe it may be obſerved, that Revelation was given to man for a different purpoſe than to inſtruct him in philoſophy and natural hiſtory. The Moſaic account of the creation is believed, by moſt rational Chriſtians, to be allegorical. But, even if we believe the account to be literally true, another race of mankind beſides that deſcended from Adam, ſeems implied in the text: for we nowhere read of Adam and Eve having any daughters, until it is ſaid their eldeſt ſon 'Cain went out from the preſence of the Lord, and 'dwelt in the land of Nod, on the eaſt of Eden. And 'Cain knew his wife, and ſhe conceived and bare Enoch*. Who then was Cain's wife, and whence did ſhe come?

Indeed it is ſaid (chap. v. ver. 4.) that 'the days of 'Adam, after he had begotten Seth, were eight hundred 'years, and he begat ſons and daughters.' This it ſhould ſeem took place after the birth of Seth, and conſequently long after Cain had his wife; for Seth was not born till after the death of Abel. If Cain had ſiſters prior to

* Genesis, chap. iv.

that period, from amongſt whom he might have taken a wife, it is a ſingular circumſtance that Moſes ſhould not have noticed them.

Reſpect and deference are due to another deſcription of perſons; thoſe whoſe happineſs is involved in the abolition of the Slave Trade.—Some of theſe may ſay, that at preſent the agitation of a queſtion of this nature, tending to eſtabliſh an opinion, that the Africans are of an inferior ſpecies, whatever truth there may be in the opinion, is peculiarly ill-timed. When ſuch ſtrenuous and repeated, but hitherto too fruitleſs efforts, have been made to induce the legiſlature to aboliſh this infamous traffic, every opinion diſadvantageous to the Africans ought to have been repreſſed, until its publicity could not have influenced the queſtion of abolition.

To ſuch it may be replied, that the Author had not the Slave Trade at all in view in this Enquiry; his object was ſimply to inveſtigate a propoſition in natural hiſtory. He is fully perſuaded the Slave Trade is indefenſible on any hypotheſis, and he would rejoice at its abolition. The negroes are, at leaſt, equal to thouſands of Europeans, in capacity and reſponſibility; and ought, therefore, to be equally entitled to freedom and protection. Laws ought not to allow greater freedom to a *Shakeſpear* or a *Milton*, a

Locke or a *Newton*, than to men of inferior capacities; nor ſhew more reſpect to a General *Johnſtone*, or a Ducheſs of *Argyle*, than the moſt unſhapely and ill formed.

Reſpecting the opinion that negroes have no ſouls, the Author utterly diſclaims it: — he conceives that all mankind, of whatever deſcription, are alike entitled to the hope of a future ſtate.

The Atheiſt too, though he will pretend to reaſon upon philoſophical principles, will more particularly object to the doctrine herein contained, becauſe it ſeems peculiarly to require the agency of a Creator; but to him no further reply is thought neceſſary than what is contained in the general argument.

Under the idea that whatever tends to elucidate the nature, conſtitution, and hiſtory of the human race, muſt be intereſting to man; and that whatever tends to diſplay the wiſdom, order, and harmony of the creation, and to evince the neceſſity of recurring to a Deity as a firſt cauſe, muſt be agreeable to man, the Author ſubmits this Work to the judgment of the public.

APPENDIX.

DETACHED PASSAGES,

SELECTED FROM

PROFESSOR SOEMMERING'S ESSAY

ON THE

COMPARATIVE ANATOMY

OF

THE NEGRO AND EUROPEAN*.

I. IN a converſation with Profeſſor *Lichtenberg* on the ſubject of this Eſſay, he with great acuteneſs directed my attention to the manner in which the connexion is made between the head and trunk in the Negro and European. In the former (as if a portion of the hind part of the ſkull were removed) the depreſſion between the head and ſhoulders is much leſs conſiderable: a conformation

* Ueber die Korperliche Verſchiedenheit des Negers von Europaër. Frankfurt & Mainz, 1785.

exhibited by animals of the ape tribe * in a ſtill more remarkable degree.

II. In the Negro the aperture of the eye-lids is ſmaller than in the European; and of courſe leſs of the eye is viſible. The eye-ball is perhaps larger; a blackiſh ring, about half a line in breadth, ſurrounds the cornea; and the albuginea (as in ſome apes) inſtead of a pearly white, is of a dirty yellow colour.

That proceſs in the inner canthus, which bears ſome analogy to the *membrana nictitans*, is, according to *Camper*'s obſervations, and my own, larger in the Negro.

The iris is in general of an uniform dark brown colour; and Dr. *Walter* † remarks that it is broader towards the temples than towards the noſe.

The external ſurface of the choroid coat is completely inveſted by mucus of a darker hue and firmer conſiſtency

* The author wiſhes his readers to apply this, and ſimilar expreſſions, principally to the orang-outang *(Simia Satyrus)* or to that animal and the pigmy ape, *Simia Sylvanus*.

† *Von den Venen des Auges.*

than uſual. A proviſion of the ſame kind appears in the eyes of ſome *ſimiæ** in my collection.

The uncommonly black pigment which lines this coat, has been noticed by Dr. *Loder* and Dr. *Walter*, as well as by myſelf.

Dr. *Walter* thinks that the *retina* is of a more robuſt texture than in Europeans.

III. The noſe is flat, ſhort, and diſproportionably broad; and may be ſaid to lie on the upper lip, rather than to project over it. Its extremity is obtuſe, and turned upwards. The noſtrils are wide.

IV. Although the Negro's lips are large and turgid, and incline more to a bluiſh black than to a dirty roſe-colour, they afford an obvious and deciſive characteriſtic, which diſtinguiſhes him from all animals of the ape genus†. For Nature has refuſed lips to every animal of that tribe, without an exception in favour of the orang-outang, who has no farther claim to a pre-eminence than what is conferred by the caprice of artiſts‡.

* *S. Cynomalgus. S. Mormon.*

† This is accounted for in the body of this work, p. 67, 68.

‡ This animal is repreſented with lips in the following excellent engravings,

I am at a loſs to divine Mr. *Kluegel's* * reaſon for aſſerting that the colour of the Negro's lips is a *beautiful red*. In order to aſcertain the accuracy of my own ſtatement, I wrote to Mr. *Billmann*, whoſe ſituation at *Caſſel* enabled him to examine many African Negroes, and on whoſe veracity and diſcernment I can rely with confidence. He informs me that their lips are invariably of a dirty roſe-colour, which admits of various degrees of intenſity in different ſubjects; but that, even in thoſe inſtances where the lips are ſo light as to form no ſtriking contraſt with thoſe of Europeans, their *rete mucoſum* is perceptibly tinged with the prevailing hue of the complexion. He is of opinion, that without any regard to the darker or lighter colour of the body, the lips of young Negroes are never ſo deeply ſtained as thoſe of adults. He met with one man, whoſe lips were ſo black, that it would not have been eaſy to diſtinguiſh them, by colour alone, from the reſt of the face. This perſon was by no means ſo dark as many of his countrymen, but appeared to be advanced in years. Mr. B. is, in ſhort, fully convinced that the lips of Negroes, whether male or female, are at no period of

Tyson's Anatomy of a Pygmy, tab. I. Edwards's Gleanings of Natural Hiſtory, part I. tab. 213. Vosmaer Beſchryving van de zo zeldſame als zonderlinge Aap-ſoort genaamd Orang-outang van het Eiland Borneo, &c. Tabb. xiv. xv.

* *Encyclopedie.* Berlin, 1782, I. Band. § 329. *Conf.* Wuensch, *Koſmologiſche Unterhaltungen*, III. B. § 86.

life of ſo pure a red as thoſe of Europeans; and that they conſtantly approach more or leſs to blackneſs.

V. The Ear is of a more circular ſhape than in Europeans; and reſembles, ſomewhat more cloſely, the ſame organ in apes. It ſeems frequently to project farther than uſual from the head. It is a well-known fact, that ſavages can move their ears at pleaſure, and poſſeſs the ſenſe of hearing in great perfection *.

VI. To thoſe who have frequent opportunities of ſeeing Negroes, it may ſeem ſuperfluous to remark, that the relative proportion of the features hitherto deſcribed, differ widely in different individuals; and form as great a variety of phyſiognomies as prevails in Europe. The features of ſome Europeans are not unlike thoſe of Negroes. A perſon of this deſcription lives in my neighbourhood; but his mother, it muſt be confeſſed, was ſuſpected of improper intercourſe with an African. The ſkull of a Thuringian, in the poſſeſſion of Dr. *Loder*, has prominent jaw-bones, wide noſtrils, a flat noſe, &c. forming, in the eſtimation of the owner, an intermediate link between the European and the Negro. A ſtudent of his acquaintance has almoſt the entire phyſiognomy of a Negro. The uncertainty, however, with reſpect to male parents, ought to be called to mind on theſe occaſions.

* Blumenbach *vom Bildungstriebe*, § 39.]

In like manner, ſome Negroes are handſomer than others. M. *Adanſon* *, for inſtance, maintains that the Negroes of *Senegal* are the handſomeſt of the race.

VII. The jaw-bones, and the cavities which contribute to form and to protect the organs of ſenſe (whether conſidered abſolutely, or with a reference to the reſt of the head) are conſtructed on a larger ſcale in the Negro; and are probably better adapted to their office than in thoſe tribes of mankind in whom a ſuperior underſtanding ſupplies the imperfection of mere animal accompliſhments. If we were to take for a baſis the bones compoſing the face of an African, and endeavour to complete the ſkull according to the proportions of European ſymmetry, the ſpace allotted to the brain, on ſuch a ſyſtem, would be uncommonly large. But this part of the ſubject will be diſcuſſed in a future paragraph.

VIII. *Camper* has proved, agreeably to the principle of his facial line, that, in the fineſt Grecian relic of ideal beauty, the bones of the head are in the largeſt, and thoſe of the face in the ſmalleſt poſſible proportion. The brow advances to a line with the noſe, mingles with the arch of the head, and, like the occiput, is loſt in a gentle curve :— a conformation eminently fitted to provide an ample ſpace for the brain.

* Hiſtoire Naturelle de Senegal, p. 22

IX. In the conſtruction of the Negro's ſkull, which is low and flat, both behind and before, Nature ſeems almoſt to have reverſed the proportions of her favourite model. Were we to compare two ſkulls, in which the diſtance between the root of the noſe and the alveoli was equal, we ſhould find the os frontis longer in the European than in the Negro. The depreſſion between the ſuperciliary arches is tolerably well expreſſed on the ſkull of an old Negro in my collection, though wanting in one of Profeſſor *Blumenbach*'s ſpecimens. The foramen magnum of the os occipitis appears to be ſomewhat wider; and the condyloid proceſſes ſeem to be placed farther forwards in the Negro than in the European.

X. The Negro ſkull, viewed in front, appears to be compreſſed at the ſides, eſpecially at the upper part; its cavity ſeems to be ſtraiter; and the parietal bones ſmaller in every dimenſion, than in European ſkulls. In ſome of the fineſt ſpecimens of mummies, according to *Blumenbach*, the head is ſtill more compreſſed than in the Negro *.

In *Camper*'s unpubliſhed Commentaries on Oſteology, the breadth of the head is ſaid to be greateſt in the Aſiatic, of middle ſize in the European, and leaſt in the African. But although this remark, ſo far as it reſpects the Negro,

* *Gottingiſche Anzeigen*, 1785, § 109.

accords with my own experience, it does not apply with equal univerſality to mummies; for the diameter of a ſkull of this deſcription, preſerved in the Anatomical Theatre at *Caſſel*, does not vary in the leaſt from the European model.

XI. The impreſſion left by the attachment of the upper margin of the temporal muſcle, extending from the os frontis over nearly the whole of the os parietale, is deeper, and aſcends nearer to the ſagittal ſuture in the Negro than in the European. Hence we might infer the ſuperior ſize of that muſcle, if opportunities were wanting of examining it in the recent ſubject.

XII. The extraordinary height and circumference of the zygomatic arch can leave little doubt that the bulk of the temporal muſcle is likewiſe very conſiderable. On this cauſe depends the protuberance of the cheek-bones, which are uncommonly large, and nearly quadrangular.

XIII. The orbit is deeper, the line deſcribed by its margin is of greater length, and the eye itſelf is probably larger in the Negro than in the European. Profeſſor *Bonn* has remarked a ſimilarity in the conſtruction of theſe cavities, between a Negreſs and the ape*. "Foramina "oculorum in uno eodemque plano verticali poſita, quod "ſimiis proprium."

* Deſcriptio Theſauri Hoviani, p. 133.

XIV. The naſal bones (which are in one inſtance of a quadrangular ſhape, but in another converge, as in apes, ſo as to form a very acute angle at their junction with the os frontis) lie, in two ſpecimens, nearly in the ſame plane, without forming a ſaddle. In a third ſkull they do not ſenſibly differ from the ſame bones in Europeans.

XV. That part of the os unguis which receives the lachrymal duct, and is ſeparated from the reſt by a prominent line, is in theſe ſkulls remarkably ſmall; and the channel of the duct is, of courſe, formed principally in the naſal proceſs of the upper maxillary bone.

XVI. When the head is ſeen in front, the cavity of the noſe appears uncommonly large. In Europeans, under ſimilar circumſtances, I have been unable to diſcover ſo wide a portal to the organ of ſmell, or a cavity ſo extenſive within. Profeſſor Bonn obſerves of the ſkull of a negreſs, "rictus naſi major." In the ſkull of a North American Chief, in Profeſſor *Blumenbach*'s collection, this cavity is proportionally larger than in many Negroes*.

Haller† remarks, that Negroes in the Antilles can diſtinguiſh, by ſcent, the footſteps of a Negro and a French-

* Gotting. Anzeigen. 1785, § 1. 12. *Conf.* BLUMENBACH, *Inſt. Phyſiolog.* p. 195. Commentationes Soc. Reg. *Gottingenſis*, vol. x. tab. 9.

† Elementa Phyſiologiæ, tom. v. p. 179.

man. It has been, in like manner, aſſerted of ſome inhabitants of the continent of America, that they can diſcriminate the effluvia of the natives of France, Spain, and Great Britain *. Experience muſt decide whether this obſervation will apply to the genuine Negro of Africa.

XVII. But that nature intended him to poſſeſs a more exquiſite ſenſe of ſmell than his European brethren, is evident from the ſize and configuration of the oſſa turbinata ſuperiora. The middle pair of theſe fine convoluted bones forms on each ſide of the noſe pretty large globular protuberances, which muſt conſiderably extend the ſurface of the olfactory membrane. Inſtances of the ſame mechaniſm, in an inferior degree, have been obſerved in Europeans by Profeſſor *Blumenbach* and myſelf. Such inſtances, however, being very uncommon, it is remarkable that all my Negro ſkulls ſhould agree in this peculiarity. A ſimilar luſus was pointed out to me by Dr. *Rieſs*, in a ſkull belonging to the Anatomical Theatre at Frankfort on the Main.

In one of my Negro ſpecimens, the cribriform plate of the ethnoid bone occupies a prodigious ſpace in the baſe of the ſkull.

* Pernetty *ap.* De Paaw, Recherches Philoſophiques ſur les Americains, tom. iii. p. 94.

XVIII. The meatus auditorius externus is wider than in Europeans. The maſtoid proceſs, which is wanting, or ſcarcely diſcernible in apes, attains its uſual magnitude. The ſtyloid proceſs, which is very obſcure in all my ſpecimens of ſimiæ, is of conſiderable ſize. The oſſicula auditus are of the uſual ſize and figure.

XIX. The roof of the Negro's mouth, which is perhaps wider, is evidently of greater length, and ſculptured with deeper inequalities than the Europeans. The union of the oſſa palati with the upper jaw-bone is effected rather by *ſuture* than *harmony*.

XX. The paſſage by which the noſe and mouth communicate, is of a ſize equally remarkable as the external aperture of the noſe. The pterygoid proceſſes, which are larger, and placed at a greater diſtance from each other, preſent a broader and more uneven ſurface than in Europeans.

XXI. The alveolar proceſſes of the upper jaw (which is of a ſize proportionable to the bones already deſcribed) are conſiderably protuberant, and form a characteriſtic trait in the Negro's phyſiognomy. — The ſpina naſalis, which generally reſembles a hook bent downwards, is wanting in three ſkulls. In one of them only a ſlight veſtige of it is diſcernible. — The lower part of the pyriform aperture

wants that acute margin which it commonly has in Europeans.

The foramen inciſivum is larger; but that obſcure veſtige of a *ſuture* which ſeparates the canine teeth from the inciſors, and correſponds to the partition of the *os intermaxillare* in quadrupeds, is not more ſtrongly expreſſed in the Negro than in the European. This bone may, therefore, be regarded as a general character of brutes.

The foramen and canalis infraorbitalis, like the nerve and artery they tranſmit, are larger in the Negro.

A wide arch is formed by the junction of the upper maxillary and cheek-bones; but it is leſs conſiderable in one ſpecimen than in the other two.

Profeſſor *Blumenbach* regards the protuberance of the jaw-bones as the moſt diſtinguiſhing feature in the Negro's countenance; and obſerves, that it ſerves more eſpecially to ſeparate him from the original inhabitants of Egypt, in whom (as appears from the inſpection of mummies) theſe bones, though of very uncommon ſize, were not protruded.

XXII. The fiſſura ſphæno-maxillaris is apparently larger; but the ſmall wings of the os ſphæoideum are conſiderably ſhorter than in Europeans.

XXIII. No peculiarity is to be diſcovered in the ſtructure of the vomer, or of the oſſa turbinata inferiora.

XXIV. The lower jaw, which is broad, thick, and leſs uniform on its ſurface, is ſhortened at the ſides and extremity. The angle of the jaw, which in us is generally obtuſe, approaches nearer to a right angle; that part of it which is covered by the maſſeter being unuſually broad in the Negro, as well as in the ape. This deſcription perfectly applies to three ſkulls of Negroes of mature age. But it ought not to be concealed, that a ſkull belonging to Profeſſor *Blumenbach* forms an angle of 130°, which is not uncommon in Europeans, among whom this angle is exceedingly liable to vary in different individuals.

XXV. The teeth are generally ſound, and compoſe a very compact row. They are broad, thick, and long; more eſpecially the canine teeth. Their number, in an inſtance where there were three *molares* more than uſual, amounted to thirty-five. The tooth correſponding to the ſixth *molaris* in the lower jaw, on the left ſide, had not made its appearance. Mr. Billman, who has been at the trouble of counting the teeth in various ſubjects, aſſures me that he never found more than the uſual number. The Negro's teeth are not exempt from caries, as appears from ſpecimens in my muſeum.

In a communication to Dr. *George Forſter*, Profeſſor *Camper* aſcribes the confuſed arrangement of the teeth, which is frequent in all the northern tribes of mankind, to the ſmallneſs of the ſpace comprized between the canine teeth of the lower jaw. Theſe ſeem to diſplace the inciſors; for the jaw-bones are not only narrower in the inhabitants of the north than in the natives of the ſouthern hemiſphere, but appear of very inconſiderable breadth when contraſted with thoſe of an African or Aſiatic.

In conſequence of the upper jaw protruding immediately below the noſe, the alveolar proceſs and teeth obtain an oblique direction; and form, with the line in which the maxillæ meet, an acuter angle than in Europeans. This is admirably demonſtrated in the drawings of *Camper* *.

XXVI. The tongue, as might be expected from the parietes that incloſe it, is larger in the Negro than in the European.

Slender bony proceſſes †, about half an inch long, were attached to the leſs appendices of the os hyoides. Theſe were not produced by oſſification of the ligaments; for, in

* Blumenbach Oſteologie, p. 87.

† They perfectly reſemble thoſe delineated by PLANCUS: *De Monſtris Epiſt.* Venet. 1749, tab. iii. *fig.* 5. and are not peculiar to the Negro, as I have frequently obſerved them in Europeans of different ſexes.

the ſubject in queſtion, many of the bones (the humerus for inſtance) had not completed their growth.

XXVII. None of the muſcles of the face, except the maſſeters, and thoſe of the external ear, are uncommonly large. From the extraordinary ſize of the maſſeters, and from what has been ſuggeſted concerning another muſcle employed in manducation, it may be preſumed that the Negro, in his native climate, was deſigned to ſubſiſt chiefly on vegetables.

XXVIII. The ribs are larger, and more boldly curved than in Europeans. This is ſtill evident in the natural ſkeletons, which have loſt by exſiccation more than two Pariſian inches in height.

In one inſtance within my own obſervation, and in three recorded by *Camper*, ſeven (or the ordinary number of) ribs were attached to the ſternum; but the eighth appeared to approach nearer to the ſternum than uſual.

In one of my ſkeletons, and in a preparation deſcribed by *Camper* *, the ſternum receives the cartilages of eight ribs on each ſide. In apes, eight or more ribs are generally attached to it. Inſtances of this ſometimes occur in

* Verhandeling over den Orang-Outang, p. 15. § 7.

Europeans, as in a body which I diſſected a few days ago*.

XXIX. An acceſſary muſcle of the cheſt was diſcovered in a Negro by Dr. Bonn †. It originated by a tendon from the cartilage of the third, and was implanted in the ſixth rib, near its termination. This muſcle is conſtant in quadrupeds ‡; and one correſponding to it has been occaſionally obſerved in Europeans ‖.

XXX. The female breaſts, according to various writers, are flaccid and pendulous.

* The number of true ribs in the *Patas*, *Malbrouck*, *Magot*, and *Papion*, is *eight*, according to Daubenton: in the *Mone*, *Coaita*, *Sajon Brun* (my ſpecimen of which has only eight) *Sai* and *Saimiri*, *nine*. The *Jocko*, *Gibbon*, *Talepoin*, and *Ouiſtiti* have *ſeven*, like the human ſpecies. Eight is ſtated to be the general number in the ape-genus, by Riolanus, *Oſteologia Simiæ, ſive oſſium ſimiæ & hominis comparatio*; of which an extract is given by Tyſon, p. 67. *Conf.* Camper, l. c. and Volcher Coiter, *Externarum & Internarum C. H. partium tabulæ*, Norib. 1573, *tab. ad pag.* 66.

Camper's Orang-Outang had only ſix true ribs. It is ſingular, that although Tyſon's Pygmy is ſtated in the text to have no more than ſeven, the cartilage of the eighth rib is, in his plate of the ſkeleton, attached to the ſternum. It is hazardous to entruſt artiſts with the execution of anatomical deſigns.

† Sandifort, *Exercit. Acad.* faſc. 1. Lugd. Bat. 1783, p. 83.

‡ Douglas, *Deſcriptio Comparata Muſculorum Hominis & Quadrupedis.*— L. B. 1729, p. 29.

‖ Albinus, *Muſc. Hom.* L. B. 1734, lib. iii. cap. 78. p. 291.

XXXI. The ſhoulders are not ſo broad and muſcular as in Europeans.

XXXII. The navel forms a round projection, like a ſmall hernia.

XXXIII. The Negro is ſlender in the iliac region. One of my ſkeletons has ſix lumbar vertebræ, without any variation in the number of cervical or dorſal vertebræ: an anomaly which I have witneſſed in Europeans on different occaſions*. The foramina, which admit veſſels and ligaments, are in all the vertebræ, but more eſpecially in thoſe of the back, of a very extraordinary ſize. The hips and pelvis are narrow.

Dimenſions of the Pelvis.

1. In the ſkeleton of a male Negro, æt. 20.

	Inches.	Lines.
Large diameter - - - - -	3	11½
Small diameter - - - - -	3	7½

* The late Mr. *George Hunter* (ſon to Dr. *H.* of York) informed me that he had met with ſix lumbar vertebræ in the diſſection of a Negreſs; and that ſeveral experienced anatomiſts in London had regarded it as a very extraordinary occurrence. The following paſſage from *Camper*, may be adduced, if neceſſary, in

2. Of a Male Negro, æt. 14.

	Inches.	Lines.
Large diameter - - - - -	3	2
Small diameter - - - - -	2	9

3. Of a European, æt. 16.

Large diameter - - - - -	4	3
Small diameter - - - - -	3	9

4. Of a well-made European adult, of inferior ſize to the Negro, No. 1.

Large diameter - - - - -	4	6
Small diameter - - - - -	3	11

Camper * remarks, that the large diameter of the pelvis is to its ſmaller diameter in the following proportion:

In a Negro - - - -	as	39	to	$27\frac{1}{2}$
In an European - - - -		41	to	27

Although this Negro was much taller than the European.

ſupport of Dr. *Soemmering*'s aſſertion:—"Reticere non debeo, in aliquibus ſpinis "ſex vertebras lumborum obſervari; duas tales in muſeo meo aſſervo. Diviſio "arteriæ aortæ tunc longe altior eſt, quam ſi quinque darentur," &c. *Demonſtrationes Anatomico-Pathologicæ*, lib. ii. cap. 2. § 1. *E. H.*

* Verhandelingen der Bataafsch Genootſchap te Rotterdam. I. Deel.

In another European	as	44	to	28
Albinus's Male Skeleton		66	to	43
In a Female European, meaſuring 4 feet 4 inches		49	to	28
In two others		44	to	28
Farneſe Hercules		48	to	34
Antinous		40	to	34
Apollo		36	to	28
According to Albert Durer		35	to	20
Medicean Venus		46	to	34

XXXIV. The parts of generation, contrary to a vulgar notion, are of no uncommon ſize. In two inſtances the prepuce was rather longer than uſual; but it ſhould be recollected that the Negroes of Senegal, who are not Mahometans, circumciſe their children at the age of four or five; and that circumciſion is likewiſe practiſed at Angola.

Littre aſſerts, that the naked extremity of the glans is black, like the reſt of the ſkin*. This was not diſcernible in the Negoes I inſpected; probably owing to the length of the prepuce.

XXXV. The fingers and toes are beautiful; but (as in apes) of uncommon length. They were all furniſhed with

* Memoires de l'Acad. des Sciences, 1702.

ſeſamoid bones, which occur more rarely in Europeans. Dr. *Strack*, Dean of the Medical Faculty in this Univerſity, remarked, both in my ſkeletons, and in living Negroes, that the hands and feet were unuſually flat. The bones of the leg are placed obliquely outwards under the condyles of the os femoris; ſo that the knees are more diſtant from each other, and the feet are bent outwards. This deformity, which has been noticed by others, ought not to be regarded as a vicious conformation, as it is probably in uniſon with the reſt of the frame.

XXXVI. But to proceed to the deviations which more eſpecially affect the brain. Of theſe, it may be remarked, that they are not the creatures of art, nor of accident; but are general, if not invariable; and differ only in degree in different individuals. Moſt of the peculiarities now to be mentioned are to be ſeen in every ſpecimen I have examined in the collections of others *, and in five very complete ſkulls which are in my poſſeſſion. It will readily occur to my readers, that, in ſome inſtances, one or more of theſe characters may be wanting; as in Europeans, independently of diſeaſe, the bones often loſe their diſtinguiſhing form. The height of the lower jaw, for inſtance, in aged perſons who have loſt their teeth, is frequently exceeded by its breadth; and the ſpace between the noſtrils

* Viz. Thoſe of *Camper* at Klein-hankum; of *Hovius* at Amſterdam; of *Walter* at Berlin; and of *Blumenback* at Gottingen.

and the lower margin of the alveoli is, under the ſame circumſtances, frequently inconſiderable.

XXXVII. I meaſured the ſkulls of various Negroes, and almoſt every European ſkull in my collection, to compare the ſize of their reſpective cavities.

1. I found the length of a cord paſſed from the root of the noſe, over the middle of the os frontis, and along the ſagittal ſuture to the middle of the poſterior margin of the os occipitis, to be leſs in the Negro than in the European. The vertical arch is, therefore, ſmaller. In ſelecting the ſpecimens to be compared, care was taken that the bones of the face were of equal length.

2. The circumference of the Negro ſkull, aſcertained by a cord paſſing horizontally over the eye-brows, and the upper margin of the os temporum, is conſiderably leſs.

3. Neither the largeſt diameter of the ſkull, from the os frontis to the os occipitis; nor any ſmaller diameter, from one os parietale, or os temporum, to the other, attain the ſize they poſſeſs in Europeans *.

* The longitudinal diameter of the ſkull in a full-grown Negro, was 6 inches, 6 lines (Paris): the largeſt tranſverſe diameter, 4 inches, 6 lines.

In a Negro, æt. 20

	In.	*L.*
Longitudinal diameter - - -	6	11
Largeſt tranſverſe, do. - - -	4	10

4, 5, 6, 7. The principal bones which form the cavity of the cranium are, as has been ſhewn, collectively ſmaller. The os frontis, oſſa parietalia, os occipitis, and os ſphenoides appear ſmaller; although the oſſa petroſa and the os ethmoides ſeem larger.

8. Theſe bones poſſeſs a hard, compact, and brittle texture, like thoſe of quadrupeds.

9. It muſt, however, be allowed, that the cavity of the Negro's ſkull ſomewhat exceeds in height that of the European.

From the preceding remarks we may infer, that in the Negro the ſize of this cavity bears a ſmaller proportion to the face and organs of ſenſe, than it does in the European.

Negro, æt. 14

Longitudinal diameter - - -	6	7
Tranſverſe diameter - - -	4	9

In Europeans, where the bones of the face were much ſmaller, than in the preceding inſtances.

Male.		Female.		Female.	
6	6	6	6	6	8
5	6	5	1	5	3

Frenchmen		Skull from Berlin	
6	10	6	6
5	10	5	6

XXXVIII. Daubenton firſt eſtabliſhed the poſition, that in quadrupeds the foramen ovale is placed behind the centre of gravity in the baſe of the ſkull; whilſt in man this opening occupies the centre*: a fact fatal to their hypotheſis, who conceive the human race deſtined to crawl on all fours. In children the condyloid proceſſes of the os occipitis are ſituated more anteriorly than in adults. In the Orang-outang †, and the reſt of the ſimiæ, the foramen is placed behind the centre. In the Negro it appears to lie not quite ſo forward as in us.

This may be the reaſon why a Negro's ſkull, after the maxilla inferior is removed, being laid on a table, falls backward, ſo that the teeth do not touch, but are ſuſpended at the diſtance of more than a line above the ſurface of the table.

The ſkulls of Europeans of mature age, uſually incline forwards, and reſt with equal eaſe on the teeth, or on the os occipitis. I have not, to my knowledge, been anticipated in this remark; but all Negro ſkulls do not poſſeſs the property I have deſcribed.

XXXIX. The brain of a male Negro, aged 14, weighed two pounds, ten ounces, and three eighths (Caſſel ſilver

* Memoires de l'Acad. des Sciences, 1764.

† Camper: Verhandeling over den Orang-outang, Tab. ii. fig. 2.

weight); that of a Negro aged 20, but who had not perfectly completed his growth, weighed two pounds, thirteen ounces, and one quarter; viz. the cerebrum two pounds, seven ounces, one eighth, and the cerebellum six ounces, one eighth; a weight which the encephalon does not always attain in Europeans; for I have dissected adults whose brain weighed only two pounds, five ounces, and seven eighths. The last mentioned Negro was, however, uncommonly handsome, tall, and robust.

XL. Dr. *Walter*, like his predecessor Dr. Mickel, observes, that the medullary substance of the brain of a Negro he dissected, was of a firmer texture than usual; and possessed that degree of elasticity which sometimes occurs in the brain of lunatics. Now hence, probably, he inferred the superior firmness of the retina. (Vid. § VII.)

XLI. The nerves on the basis of the brain, on a comparison with those of Europeans under like conditions, appear somewhat thicker. This difference, which is most striking in the olfactory, optic, and fifth pairs, might be presumed from analogy. For, if the eye, ear, and organ of smell be larger, as has been stated, we must expect that the nerves which supply these organs will have a correspondent magnitude.

XLII. An examination of the brain of different classes of animals, conducted with great care, and under very

favourable circumſtances, led me long ago * to the eſtabliſhment of the following propoſition; which has been ſince adopted and confirmed by that eminent phyſiologiſt, Dr. Monro †:—*Man has a larger brain than any other animal, if an eſtimate be formed of the proportion which the brain bears to the nerves derived from it.*

It was formerly taken for granted, that man poſſeſſed a larger brain than any other animal. To prove this, it was uſual to compare the weight of the brain and of the body in man, and in the moſt common domeſtic animals. Thus far theory bore the teſt of experiment. But phyſiologiſts, deſirous of eſtabliſhing the fact on a wider induction, were involved in no ſmall perplexity. They found, on this principle, that birds ſtood higher in the ſcale than man; and that ſeals (*cetacea*) and more eſpecially the ſmaller quadrupeds, as the mouſe, ſquirrel, &c. poſſeſſed an infinitely larger brain, in compariſon with their body, though certainly not with reſpect to the organs of ſenſe, or that part of the head which forms the face.

No poſitive concluſion can be drawn from an experiment in which the weight of the body, liable to be affected by

* De Baſi Encephali. Gottingæ, 1778, page 17.

† Obſervations on the Structure and Functions of the Nervous Syſtem. Edinburgh, 1783, chap. viii.

fatigue, diſeaſe, the accumulation and loſs of fat, &c. is compared with that of brain, which is more conſtant, and ſecure from ſome of the cauſes which have been enumerated. On the other hand, a compariſon of the ſize of the brain with that of the nerves, is not only attended with leſs difficulty, but promiſes important concluſions.

XLIII. I am far from conſidering the nerves as excretory ducts of the brain; for it appears to me, that a very ſmall portion of brain is requiſite to enable them to perform the functions of vegetation, or mere animal life.

XLIV. A being, therefore, that, in an eminent degree poſſeſſes more than is neceſſary for this purpoſe, may be preſumed to inherit a ſuperior capacity of intellect.

XLV. Conſidered in this point of view, man, who in any other light holds but a middle ſtation, ſtands confeſſedly at the head of the animal world. Apes of every deſcription (for I have been ſo fortunate as to procure diſſections from the four primary diviſions of that genus) are, in this reſpect greatly inferior to him; for, notwithſtanding the brain of theſe animals (eſpecially of the ſmaller ſpecies, with prehenſile tails) is heavier than the human brain, when compared with the weight of the body,—it ſhould be recollected, that the eye, ear, tongue, noſe, and

muſcles of maſtication, require, as being conſtructed on a larger ſcale, a greater ſupply of ſenſorial power to animate the nerves which are ſpent on theſe organs. Setting apart, therefore, a portion of their encephalon ſufficient for theſe uſes, the brain of theſe animals dwindles, in compariſon with the human brain, almoſt to a cypher.

Animals of various kinds ſeem to poſſeſs this ſuperabundant portion of brain in a greater or leſs degree, in proportion to their ſagacity or docility *.

The largeſt brain of a horſe, which I poſſeſs, weighs one pound, ſeven ounces: the ſmalleſt human brain that I have met with in an adult, two pounds, five ounces, one quarter. But the nerves on the baſe of the horſe's brain are ten times larger than in the other inſtance, notwithſtanding it weighs leſs by fourteen ounces, one quarter.

XLVI. But we are not haſtily to conclude that the human ſpecies have ſmaller nerves than any other animal. In order that my ideas may be better underſtood, I ſhall ſtate the following imaginary caſe.

Suppoſe the ball of the eye to require 600 nervous fibrils in one inſtance; and 300 in another, though only

* Vid. Ebel: *Obſervationes Neurologicæ ex Anatome Comparata.* Traj. ad Viadr. 1788.

half the ſize of the former: farther, that the animal with 600 fibrils poſſeſſes a brain of ſeven, and that with only 300 a brain of only five drams; to the latter we ought to aſcribe the larger brain, and a more ample capacity of regiſtering the impreſſions made on the organ of viſion: for, allowing one dram of encephalon to 100 fibrils, the brain which abſolutely is the leaſt, will have a ſuperfluous quantity of two drams, while the larger has one only.

That the eye, which is ſupplied with a double quantity of fibrils may be a more complete organ of ſenſe, will be readily admitted; but the remark is inapplicable to the ſubject in diſpute.

XLVII. Having premiſed that the nerves are larger in the Negro, we infer, by analogy, that his brain is ſmaller than that of the European.

NOTES

TO

THE GRADATION IN MAN.

NOTE I. In the 36th note to the Botanic Garden, is the following paragraph on Vegetable Circulation.

" The parts which we may expect to find in the anatomy of vegetables, correſpondent to thoſe in the animal œconomy, are, 1. A ſyſtem of abſorbent veſſels to imbibe the moiſture of the earth, ſimilar to the lacteal veſſels, as in the roots of plants; and another ſyſtem of abſorbents ſimilar to the lymphatics of animal bodies, opening its mouths on the internal cells and external ſurfaces of vegetables; and a third ſyſtem of abſorbent veſſels, correſponding with thoſe of the placentation of the animal fœtus. 2. A pulmonary ſyſtem correſpondent to the lungs, or gills, of quadrupeds and fiſh, by which the fluid abſorbed by the lacteals and lymphatics may be expoſed to the influence of the air: this is done by the green leaves of plants; thoſe in the air reſembling lungs, and thoſe in the water reſembling gills; and by the petals of flowers. 3. Arterial ſyſtem, to convey the fluid thus elaborated, to the various glands of the vegetable, for the purpoſe of its growth, nutrition, and various ſecretions; the various glands which ſeparate from the vegetable blood the honey, wax, gum, reſin, ſtarch, ſugar, eſſential oil, &c. 5. The organs adapted for their propagation or reproduction. 6. Muſcles to perform ſeveral motions of their parts.

NOTE II. Mr. *Whittaker,* in his Hiſtory of Mancheſter, deſcribes five principal ſorts of dogs, which he ſays ſeem to be natives of the ſoil: the great houſehold dog, or maſtiff; the bull-dog; the greyhound; the terrier; and the large ſlow hound. The maſtiff is mentioned in the Hiſtory of Henry VII. and juſt ſuch as is repreſented upon a coin of Cunobolin. *Claudian* ſpeaks of the bull-dog to the following effect:

——————— the Britiſh hound,
That wrings the Bull's big forehead to the ground.

And *Lymachus,* a contemporary of *Claudian,* deſcribes the amazement of the Roman people at ſeeing ſome Iriſh bull-dogs produced in the circus. *Martial* mentions the greyhound; and *Oppian,* who lived in the time of *Severus,* deſcribes the terrier as a native of this iſle. The large ſlow hound, called the ſouthern, or Mancheſter hound, is deſcribed by *Shakeſpear* in his Midſummer Night's Dream, two centuries ago. It deſerves to be noticed, therefore, that after the lapſe of ſo many generations, and conſidering the free intercourſe of dogs, and the number of mongrels that muſt have been produced, ſtill the different kinds remain entire, and diſtinctly characteriſtic.

NOTE III. The natural hiſtory of the Polypus is in itſelf ſo curious, and at the ſame time ſo well calculated to ſupport the opinion maintained in this paper, that we thought the following account from Mr. *Smellie* would be very proper. He ſays, " In a word, nature " in the ſtructure and functions of animals deſcends, by degrees almoſt " imperceptible, from man to the polypus: a being which, ever ſince " its properties were diſcovered by Mr. *Trembley,* has continued to aſto- " niſh both philoſophers and naturaliſts. The ſtructure of the polypus, " which inhabits freſh water pools and ditches, is extremely ſimple. " Its body conſiſts of a ſingle tube, with long *tentacula,* or arms, at one " extremity, by which it ſeizes ſmall worms, and conveys them to its " mouth. It has no proper head, heart, ſtomach, or inteſtines of any " kind. This ſimplicity of ſtructure gives riſe to an equal ſimplicity in

" the œconomy and functions of the animal. The polypus, though it has
" not the diſtinction of ſex, is extremely prolific. When about to mul-
" tiply, a ſmall protuberance or bud appears on the ſurface of the body;
" this bud gradually ſwells and extends; it includes not a young poly-
" pus, but is the real animal in miniature, united to the mother as the
" ſucker to the parent tree. The food taken by the mother paſſes
" into the young by means of a communicating aperture. When the
" ſhooting polypus has acquired a certain growth, this aperture gradu-
" ally cloſes, and the young drops off to multiply its ſpecies in the
" ſame manner. As every part of the polypus is capable of ſending off
" ſhoots, it often happens that the young, before parting with the
" mother, begins to ſhoot, and the parent animal carries ſeveral gene-
" rations on her own body. There is another ſingularity in the hiſ-
" tory of the polypus. When cut to pieces in every direction fancy
" can ſuggeſt, it not only continues to exiſt, but each ſection ſoon be-
" comes an animal of the ſame kind. What is ſtill more ſurprizing,
" when inverted, as a man inverts the finger of a glove, the polypus
" ſeems to have ſuffered no material injury, for it ſoon begins to take
" food, and to perform every other natural function. Here we have
" a wonderful inſtance of animal ductility. No diviſion, however mi-
" nute, can deprive theſe worms of life. What infallibly deſtroys
" other animals, ſerves only in the polypus to multiply the number of
" individuals. M. *Trembley*, in the courſe of his experiments, diſcovered
" that different portions of one polypus could be engrafted on another.
" Two tranſverſe ſections brought in contact, quickly unite and form
" an animal, though each ſection belongs to a different ſpecies. The
" head of one ſpecies may be engrafted on another. When a polypus
" is introduced by the tail into another body, the two heads unite and
" form one individual. M. *Trembley* gave ſcope to his fancy, and by
" repeatedly ſplitting the head and part of the body, formed hydras
" more complicated than ever ſtruck the imagination of the moſt ro-
" mantic fabuliſt."

NOTE IV. Since writing the article concerning the Chimpanzee, I have ſeen the Report of the Directors of the *Sierra Leone* Company, at p. 164, of which is the following obſervation; which for its authenticity and importance merits a place.

"To the article of quadrupeds ſhould be added the Japanzee or "Champanzee, common in the mountains: an animal more nearly re- "lated to the human race than even the Ourang-outang. Of two that "were brought alive into the colony, one died ſoon; the other being "older, lived ſome months. He was nearly two feet high; but thoſe "that are full grown are nearly five feet in height. He was covered "with black hair, long and thick on the back, but ſhort and thin on "the breaſt and belly; his face was bare; his hands and his head bore "the greateſt reſemblance to the hands and head of an old black man, "except that the hairs on his head were ſtraight; he ate, drank, and "ſlept, and ſat at table, after the ſame manner as a human being. "At firſt he crawled on all fours, always walking on the outſide of "his hands; but when grown larger, he endeavoured to go erect, ſup- "porting himſelf by a ſtick, which he carried in his hand. He ſeem- "ed to be of a melancholy diſpoſition, but was always good-natured, "doing no perſon any injury. This ſpecies of ape, although not en- "tirely unknown in Europe, has uſually been confounded with that "of other apes."

NOTE V. "In this collection (of comparative anatomy) we "find an attempt to expoſe to view the gradation of nature, from "the moſt ſimple ſtate in which life is found to exiſt, up to the moſt "perfect and moſt complex of the animal creation, — man himſelf. "By the powers of his art this collector has been enabled ſo to expoſe "and preſerve in ſpirits, or in a dried ſtate, the different parts of ani- "mal bodies intended for ſimilar uſes, that the various links of the "chain of perfection are readily followed, and may be clearly under- "ſtood.

" The ſubjects are arranged in four claſſes. Firſt, Parts conſtructed " for motion. Secondly, Parts eſſential to animals reſpecting their " own internal œconomy. Thirdly, Parts ſuper-added, for purpoſes " connected with external objects. Fourthly, Parts for the propaga- " tion of the ſpecies, and maintenance or ſupport of the young. In " each of theſe claſſes he has procured and digeſted a multitude of par- " ticulars which are diſpoſed of in the order of gradation, beginning " with the moſt ſimple, and advancing, by degrees, to ſubjects of a " more complex organization."

Home's Life of Mr. John Hunter.

NOTE VI. Amongſt ſeveral well-authenticated particulars which have come to my knowledge, evincing a conſiderable degree of rationality in Parrots, is the following: — A reſpectable dyer in Manchester has for fourteen years been in poſſeſſion of a parrot which I have ſeen, and heard ſpeak, of which he gave me an account to the following purport. When hungry, ſhe ſays, " Is there nothing for " Poll? Give Poll a bit, Jacky, give Poll a bit." And if attention be not paid to her entreaties, ſhe raiſes her voice, and cries, " What the " devil, is there nothing for Poll? On hearing the voice of a Mr. M——, who is in the habit of calling at the houſe, ſhe immediately cries out, " Well, Mr. M——, how are you? What news?" and then laughs heartily. To the dogs ſhe will call out " Turk, Turk—Juno, " Juno—hic Turk, hic lad, hic rat, ſhake him there, ſhake him." If they attempt to annoy any paſſengers, ſhe will cry " Come here, " Sirrah! come here, Turk! D—n you, come here!" To the poultry ſhe will call, " Chuck, chuck;" and when aſſembled about her, ſhe will raiſe her voice, and ſay, " Shoo, ſhoo," and fright them away again. To the cat ſhe will call out, " Puſs, Puſs, poor Puſſy," &c. As ſoon as ſhe can hear the noiſe of the cart, and long before ſhe can ſee it, ſhe begins to call the horſes by their names. " Come White- " foot, come Peacock; come lad, come—back—whoop—back—haw." When her maſter is ſcolding the ſervants in the dye-houſe, ſhe runs

over her whole vocabulary of words with great rapidity; jumps upon her perch and down again, ſhakes her head, and evincing many ſymptoms of extreme agitation, cries "Cannot you mind your buſineſs, "G—d d——n you." In a morning ſhe will ſay, "Take Poll out;" and when it rains, or the day begins to cloſe, ſhe will call out, "Take "Poll in." This extraordinary Parrot will laugh, ſing, and cry.

NOTE VII. Mr. *Hunter*'s collection of ſkeletons, both human and comparative, is, I am informed, the moſt complete ever made. As it ſeems he had paid ſome attention to the ſubject of compariſon, it is to be wiſhed he had left us his opinion in writing; or that ſome perſon acquainted with them, would favour the public on that head. In the back ground of an elegant engraving of him by Mr. *Sharp*, from a portrait taken by Sir *Joſhua Reynolds*, there is delineated ſix of thoſe heads: a circumſtance in ſome meaſure indicating his ideas of gradation.

N. B. Since writing the above, the author has ſeen Mr. *J. Hunter*'s Life, by *Everard Home*; prefixed to his "Treatiſe on the Blood, In-"flammation, and Gun-ſhot Wounds," juſt publiſhed, from which ſome extracts have been made. See Note V.

Dr. *Soemmering* ſays, "In one of my negro ſkeletons I found ſix "*vertebræ* of the loins. The number of the other vertebræ was "complete: this I have more than once found in Europeans." Dr. *Marſhall*, Lecturer in Anatomy in London, informs me that he found ſix *vertebræ* of the loins in a negro, and as many in a negreſs; but that he never ſaw more than five in an European. Dr. *Monro*, Profeſſor of Anatomy at Edinburgh, informs me that he never found more than five *vertebræ lumborum* in the human ſpecies in this iſland; but he was ſhewn ſome ſkeletons at Berlin, which were ſaid to have been the firſt King of Pruſſia's regiment of Giants; and which appeared to have ſix *vertebræ lumborum*; but he ſuſpected there was ſome trick in it.

Suc, in his *Traité d'Oſteologie,* ſays, "J'ai vu pluſieurs fois ſix ver-
" tebres de lombes, & particulierement dans les ſujets qui avoient au
" deſſus de cinq pieds huits pouces."

Theſe are all the accounts I have been able to collect, of more than five *vertebræ lumborum* being found in the human ſpecies. Nothing deciſive concerning gradation can be drawn from them, becauſe the number of *vertebræ* are very uncertain in *Simiæ.* Dr. Tyſon's pigmy had five *vertebræ lumborum.* Monkeys have been found, ſome with ſix and ſome with ſeven.

NOTE VIII. The *Albinos* of Africa have hair much whiter than ever was ſeen upon an European, with the ſame curl and woollineſs as other Africans. The ſame may be ſaid of thoſe who are dappled, black and white, in thoſe parts of the ſkin which are of a white colour; but where the ſkin is black, the hair is black alſo.

A negro, who was born in Jamaica, and who, on account of a peculiarity, was ſhewn along with ſome wild beaſts in Mancheſter, had a large white blotch upon the top of his head and his forehead, extending from the crown of his head to his noſe, three or four inches broad. Upon the top of his head, where the ſkin was white, the hair was white, curled, and woolly; upon the other parts of his head the hair was black, curled, and woolly. The colour of the ſkin upon the forehead was ſimilar to that of an European ſkin, the carnea colour, not that dead white which I have ſeen in Albinos. Thoſe parts which were black, were of a jet black, or nearly ſo. He was a very handſome negro; had no *frænum præputii*; he ſaid his ſkin was dappled from his birth; at leaſt he could not remember it otherwiſe.

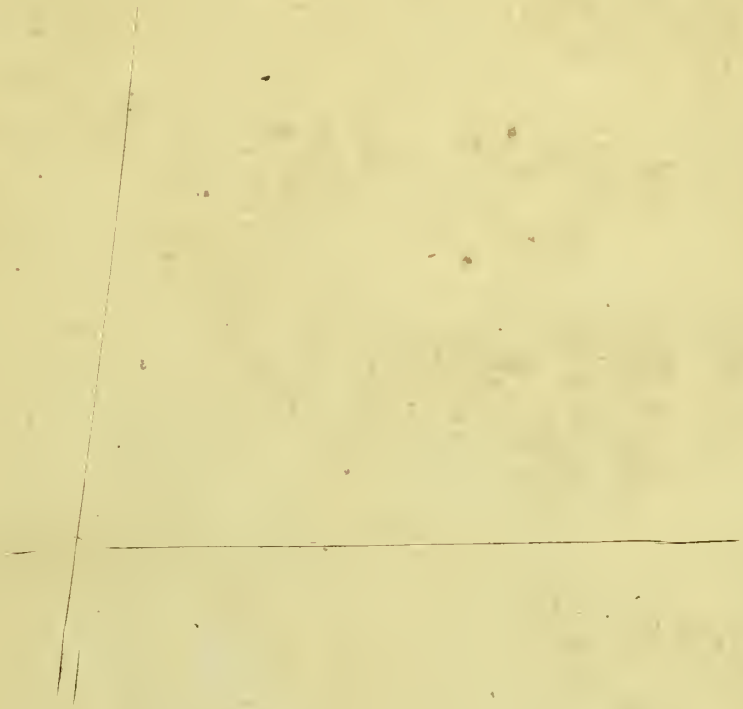
NOTE IX. A perſon ſkilled in numbers, has favoured me with the following theorems, which will ſerve to ſhew the effects of free and indiſcriminate marriages of whites and blacks, provided their offspring, in whatever degree of deſcent, were alike prolific.

" Suppoſe a colony of whites and blacks of equal numbers, and the " white men married blacks or whites indiſcriminately, and that one " thirtieth of the whole number were born and died annually; then " we obtain theſe theorems:—

" $\left|\frac{59}{60}\right|^m \times W$ = the number of Whites remaining after the expira-
" tion of m years; W being the whole number of
" Whites at firſt.

" $\left|\frac{59}{60}\right|^n B$ (or W) = the number of Blacks; B being the number
" at firſt.

" & $1-2.\left|\frac{59}{60}\right|^m x$ = the Mulattoes, or people neither abſolutely
" black nor white."

" According to theſe, in 65 years the number of Blacks, Whites, and " Mulattoes would be equal. In 91 years the Whites would be $\frac{1}{10}$, " the Blacks $\frac{1}{10}$, and the Mulattoes, or people of intermediate degrees " of colour, $\frac{8}{10}$ of the whole number. In three centuries not $\frac{1}{100}$ part of the Whites would exiſt."

THE END.